

INFORMATION PAGE

Form Approved
OMB No. 0704-0188

AD-A206 016

CTE

1 1988

1b. RESTRICTIVE MARKINGS

4nc FILE COPY

3. DISTRIBUTION / AVAILABILITY OF REPORT
Approved for public release,
distribution unlimited.

2b. DECLASSIFICATION / DOWNGRADING SCHEDULE

4. PERFORMING ORGANIZATION REPORT NUMBER(S)

H &

5. MONITORING ORGANIZATION REPORT NUMBER(S)

ARI Research Note 89-01

6a. NAME OF PERFORMING ORGANIZATION

Allen Corporation of America

6b. OFFICE SYMBOL
(if applicable)

7a. NAME OF MONITORING ORGANIZATION

U.S. Army Research Institute for the
Behavioral and Social Sciences

6c. ADDRESS (City, State, and ZIP Code)

209 Madison Street
Alexandria, VA 22314

7b. ADDRESS (City, State, and ZIP Code)

5001 Eisenhower Avenue
Alexandria, VA 22333-56008a. NAME OF FUNDING / SPONSORING
ORGANIZATION Deputy Chief of
Staff for Personnel8b. OFFICE SYMBOL
(if applicable)
DAPE-MR9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
OPM Contract 87-9002
W.O. 2002-001

8c. ADDRESS (City, State, and ZIP Code)

The Pentagon, Room 2C739
Washington, DC 20310-0300

10. SOURCE OF FUNDING NUMBERS

PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.
6.30.07	A793	(125) 1206	H.1

11. TITLE (Include Security Classification)

Manpower and Personnel Standardization Language for Army Systems

12. PERSONAL AUTHOR(S)

Barber, Jacob L., Hetler, Douglas W., and Jones, Robert E., Jr.

13a. TYPE OF REPORT

Final

13b. TIME COVERED

FROM 88-4 TO 88-10

14. DATE OF REPORT (Year, Month, Day)

1989, January

15. PAGE COUNT

76

16. SUPPLEMENTARY NOTATION

John L. Miles, Contracting Officer's Representative

17. COSATI CODES

FIELD	GROUP	SUB-GROUP

18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)

MANPRINT	Standardization
Standard	Personnel
Manpower	Specification

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

Of the six technical domains in the Army MANPRINT program, only two (manpower and personnel) are not comprehensively covered by military standards and specifications. This report contains language that, if added to some standard or specification, would place manpower and personnel on the same footing within the Department of Defense Standardization Program as the other four MANPRINT domains (training, safety, human factors engineering, and health hazards). The report proposes two feasible alternatives for adding this language to existing standardization documents (including data item descriptions). This report is intended to document the MANPRINT requirements for manpower and personnel in system development, where the focus is on operability and battlefield effectiveness (not system supportability, as in integrated logistics support).

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT

☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS

21. ABSTRACT SECURITY CLASSIFICATION

Unclassified

22a. NAME OF RESPONSIBLE INDIVIDUAL

John L. Miles, Jr.

22b. TELEPHONE (Include Area Code)

(703) 274-8917

22c. OFFICE SYMBOL

PERI-SM

ARI Research Note 89-01

Manpower and Personnel Standardization Language for Army Systems

**Jacob L. Barber, Douglas W. Hetler,
and Robert E. Jones, Jr.
Allen Corporation of America**

for

**Contracting Officer's Representative
John L. Miles, Jr.**

**Manned Systems Group
John F. Hayes, Chief**

**Systems Research Laboratory
Robin L. Keese, Director**

January 1989



**United States Army
Research Institute for the Behavioral and Social Sciences**

Approved for the public release; distribution is unlimited

U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES

**A Field Operating Agency Under the Jurisdiction
of the Deputy Chief of Staff for Personnel**

EDGARM. JOHNSON
Technical Director

JON W. BLADES
COL, IN
Commanding

Research accomplished under contract
for the Department of the Army

Allen Corporation of America

Technical review by

Diana D. Lueker
John L. Miles, Jr.

NOTICES

DISTRIBUTION: This report has been cleared for release to the Defense Technical Information Center (DTIC) to comply with regulatory requirements. It has been given no primary distribution other than to DTIC and will be available only through DTIC or the National Technical Information Service (NTIS).

FINALDISPOSITION: This report may be destroyed when it is no longer needed. Please do not return it to the U.S. Army Research Institute for the Behavioral and Social Sciences.

NOTE: The views, opinions, and findings in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other authorized documents.

MANPOWER AND PERSONNEL STANDARDIZATION LANGUAGE FOR ARMY SYSTEMS

CONTENTS

	Page
INTRODUCTION.....	1
Operational Problem.....	1
Objective of the Effort.....	1
Scope of the Effort.....	1
APPROACH.....	2
CONCLUSIONS.....	7
REFERENCES.....	8
APPENDIX A. BIBLIOGRAPHY.....	A-1
B. EVENT PHASED MANPOWER AND PERSONNEL REQUIREMENTS FOR DEVELOPMENT CONTRACTS.....	B-1
C. MANPOWER AND PERSONNEL REQUIREMENTS FOR DEVELOPMENT CONTRACTS.....	C-1
D. RECOMMENDED IMPLEMENTATION OF SECOND CHOICE.....	D-1
E. FLOW DIAGRAMS FOR DOD STANDARDIZATION DOCUMENT PROCESSING.....	E-1



Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

MANPOWER AND PERSONNEL STANDARDIZATION LANGUAGE FOR ARMY SYSTEMS

INTRODUCTION

Operational Problem

The Army's MANPRINT program consists of six domains: manpower, personnel, training, human factors engineering (HFE), health hazards, and system safety. As set forth in Subparagraph 1-5d of Army Regulation 602-2, the intent of the MANPRINT program is to have those six domains influence the design of Army materiel. Most Army materiel is designed and developed under contract by private industry. One major way in which industry communicates with government contract monitors is to deliver "data items" (customarily technical reports) on specific subjects. The Department of Defense (DOD) describes explicitly what it wants in those data items by writing formal "data item descriptions" (DIDs) which are serial numbered and managed as elements of the DOD standardization program. A long-standing program policy requires that DIDs for recurring use be tied to requirements set forth in military specifications and standards.

There is no MANPRINT standard or specification. However, four of the six domains of MANPRINT (HFE, training, health hazards, and system safety) currently have standardization programs--most established at the DOD level. Currently, no standard or specification adequately states the manpower and personnel related tasks that the contractor must perform and the manpower and personnel information to be delivered concerning the operation and effectiveness of materiel. However, manpower and personnel tasks and information requirements regarding maintenance are included in existing military standards.

Objective of the Effort

The objective of this effort was to:

- a. State, in standardization language and format, the specific MANPRINT tasks and data requirements in the manpower and personnel domains.
- b. Determine which, if any, existing standards or specifications might be modified to include these tasks and data requirements and outline how the needs for manpower and personnel standardization could most quickly and effectively be met within the DOD standardization program.

Scope of the Effort

The scope of the effort was limited to the topics of manpower and personnel within the context of the Army's MANPRINT program. Further, the effort was to deal only with military standards, military specifications and DIDs and the processes for modifying or establishing these within the DOD standardization program.

APPROACH

The first step was to understand the DOD standardization program pertaining to military standards, military specifications, and DIDs. Comprehension of the applicable options, constraints, and procedures within that program was essential in order to arrive at useful and realistic results. Accordingly, documents describing the DOD standardization program, as well as documentation on the Army MANPRINT program, were assembled and reviewed. The documents reviewed are listed in the References and in the Bibliography (Appendix A).

An outline was formulated of the manpower and personnel tasks and information requirements which could reasonably be placed upon a contractor. This outline took into account both developmental acquisition and non-developmental item acquisition (NDI). For logical coherence and completeness, the outline described a series of steps in a "stand-alone" process. That is to say that it included all of the actions that a contractor would have to take in order to generate the data and information that he would eventually be required to deliver to the government for the manpower and personnel domains of MANPRINT. Initially, the outline disregarded other MANPRINT domains as well as related programs such as Logistic System Analysis (LSA). For example, the first steps in the outline called for system function analysis, function allocation analysis, and task analysis. Similar analyses are included under the areas of training, human factors engineering, and LSA, to name but three. The issue of coordination and avoidance of duplication among MANPRINT domains and other programs, such as LSA, was deferred to later stages of the effort.

Outlining the information that was needed raised the question of the purpose for which the information was needed. In the absence of formally stated purposes, it was assumed that the information required of the contractor would be used by the government for one or more of the following:

- a. To maximize manned system effectiveness and personnel performance within the system.
- b. To minimize, for the system under development, the number, the quality level, the grade level, and the skill level of the personnel required for the system.
- c. To minimize the requirements for new Military Occupational Specialties (MOS) and for new personnel skills.
- d. To update the System MANPRINT Management Plan (SMMP), the Basis of Issue Plan (BOIP), Qualitative and Quantitative Personnel Requirements Information (QQPRI), the Manpower Estimate Report (MER), and the Manpower, Personnel, Training, and Safety (MPTS) Profile, if the latter eventually becomes a DOD requirement.

- e. To develop: MOS and Additional Skill Indicator (ASI) specifications, Standards of Grade Authorization (SGA), MOS progression structure, force structure impacts, operator and maintainer decisions, personnel classification changes, revisions to AR 611 series regulations, and distributions of quality for recruitment purposes.

It was also assumed that the government would provide to the contractor existing manpower and personnel information relevant to the system. This might include the SMMP, BOIP, QQPRI, and the AR 611 series. These assumptions helped define the scope and content of the manpower and personnel requirements which were subsequently drafted.

The completed outline, consisting of eleven steps, provided the structure for the manpower and personnel information requirements and the tasks that a contractor would need to perform in order to generate that information. This structure was expressed as a series of contractor tasks related to the phases of the Army materiel development process. In accordance with MANPRINT policy, emphasis was placed on initiating action during the earliest phases of development. These contractor tasks and the attendant quality assurance measures as related to the phases of the developmental and non-developmental materiel acquisition process are displayed on the charts in Appendix B. Numbered boxes on the charts identify each step.

Next, existing military standards, military specifications, DIDs and other relevant documents were reviewed. The purpose of this review was to determine if requirements for the manpower and personnel information were already adequately expressed in existing standardization documents. A second purpose was to identify current standardization documents which might be modified to include the needed manpower and personnel information requirements. The documents on a government furnished list of documents were reviewed along with other documents identified by knowledgeable people both within and outside the government. References within documents provided leads to additional relevant documents which were then reviewed. The Department of Defense Index of Specifications and Standards (DODISS) and the Acquisition Management Systems and Data Requirements Control List (AMS DL) were searched. Especially helpful was the report of the Manpower, Personnel and Training (MPT) Data Requirements Study (Reference 6). Numerous documents were examined in search of relevant material, however, only those documents actually reviewed are listed in Appendices A and B. Regrettably, the volume of material, the difficulty of locating relevant material from title alone, and time constraints on the effort, make it unlikely that all relevant material was reviewed.

The review confirmed that:

- a. Manpower and personnel information requirements, as expressed in existing standardization documents, are inadequate for MANPRINT purposes in materiel acquisition contracts.
- b. Most, if not all, of the needed manpower and personnel requirements have been expressed in more or less detail in some documents at some time in the past.

Thus, there was much relevant material to draw upon. Much of it did not fit the MANPRINT goal of having manpower and personnel issues influence equipment design. Only a small portion was sufficiently detailed for MANPRINT purposes. Nowhere in current standardization documents was there a coherent and complete approach to standardization language for manpower and personnel requirements in the acquisition process. The document most nearly meeting the tests of coherence and completeness was MIL-P-28700, Personnel Planning Data for Naval Systems, a Navy specification dated 1 May 1970 and no longer in use. Although the language was unsuited to MANPRINT purposes, the topical content and general structure of the document identified it as a potential candidate for modification.

Several topics, especially system function allocation, task analysis and manpower and personnel requirements for maintenance were repeatedly covered in one form or another in documents related to either training, human factors engineering or logistic system analysis, and sometimes in all three.

The experience of conducting this review highlighted the merits of the integrative effort of the MANPRINT program and underscored the urgent need for coordination, mutual use of common data and avoidance of duplication in the materiel acquisition process.

At this point, a statement was drafted describing the requirement identified in each of the eleven steps of the initial outline. These statements of the manpower and personnel requirements were prepared in language suitable for use in military standardization documents and are the primary product of this effort. The eleven statements (Appendix C) are numbered and titled to correspond to the numbers and titles used on the charts of Appendix B. The wealth of preexisting material was liberally applied in preparing these statements. Little claim is made to original writing. On the other hand, because of the redundant sources of material, mostly from government documents, and the manner in which fragments were woven into the final text, no attempt is made to cite sources for specific requirements. In general, the principal contributors to the eleven manpower and personnel standardization requirements were references 3, 7, and 9 and items number 21, 25, 26, and 30 from the bibliography.

Following the preparation of each of the eleven manpower and personnel requirements, a search of existing DIDs determined if any were applicable to the requirement. In six instances useful DIDs were found. Two new proposed DIDs were prepared. Two existing DIDs were combined into one DID proposed as a replacement for the two. In addition, two DIDs included in MIL-STD-1478, Task Analysis, (Reference 7), which the Human Engineering Laboratory (HEL) of the Army Materiel Command recently submitted to DOD for formal approval, were used to support two of the requirements. A total of eleven DIDs support the eleven manpower and personnel requirements. However, the DIDs and requirements do not match on a one-to-one basis. The DIDs supporting each requirement are identified in a note at the conclusion of each of the eleven requirement statements and are included with each of the statements in Appendix C.

The DIDs used were:

- Human Engineering Program Plan (Modified). DI-H-7051, 1 June 1979
- Human Engineering System Analysis Report. DI-H-7054, 1 June 1979
- Human Engineering Test Plan. DI-H-7053, 1 June 1979
- Human Engineering Test Report. DI-H-7058, 1 June 1979
- Manpower and Personnel Program Plan. DI-x-xxx, (Draft Proposed)
- Qualitative and Quantitative Personnel Requirements Information (QQPPI) and Training Requirements Report. DI-H-xxxx, (Draft Proposed) (Supersedes: Personnel and Training Requirements. DI-H-1300, 15 December 1969. and Qualitative and Quantitative Personnel Requirements Information (QQPRI), Part I: Field and Organizational Maintenance. DI-H-3253, 24 August 1970)
- Scientific and Technical Reports. DI-S-4057, 17 October 1973
- System/Design Trade Study Reports. DI-S-3606, 1 November 1971
- Task Analysis Report. DI-H-xxx, (HEL Draft Proposed)
- Task Inventory Report. DI-H-xxx, (HEL Draft Proposed)
- Task Performance Capability Analysis Report. DI-x-xxxx, (Draft Proposed)

Of the numerous military specifications and military standards reviewed, five emerged as potential candidates for modification to incorporate the eleven manpower and personnel requirement statements. The five were:

- a. Human Engineering Requirements for Military Systems, Equipment and Facilities. Military Specification MIL-H-46855B, Amendment 2, 5 April 1984.
- b. Integrated Logistics Support Program Requirements. Proposed Military Standard 1369A, (Undated Final draft as of May 1988).
- c. Logistic Support Analysis. Military Standard 1388-1A, 11 April 1983.
- d. Personnel Planning Data for Naval Systems. Military Specification MIL-P-28700, 1 May 1970.
- e. Task Analysis. Draft Proposed Military Standard 1478 (Draft as of July 1987).

Of these, MIL-P-28700, (d. above) and MIL-H-46855B, (a. above) were judged to be the most compatible with the eleven newly prepared manpower and personnel requirements. This judgment was based on similarities in scope, content and language between the existing documents and the proposed modifications. The advantages in favor of using MIL-P-27800 were that its subject matter is manpower and personnel, its structure is suitable and it is due for revision. The principal disadvantage was that the language is out-dated and a total rewrite would be necessary. MIL-H-46855B had the advantages of usable structure, usable content and usable MANPRINT language. Its principal disadvantage was the focus on human engineering. Neither of these two documents offered strong technical advantages over the other. Furthermore, any difference in the amount of writing for either revision was judged to be small and the administrative processing for either revision would be similar.

Modification of existing standardization documents to incorporate the proposed manpower and personnel requirements was preferred over preparation of a new document. This preference was based on the presumption of more expeditious and less complex administrative considerations for obtaining DOD standardization program approval for a modified document versus a new document.

At this point, attention turned to the policies and procedures for creating new standardization documents and for modifying existing documents. The applicable policies and procedures governing the DOD standardization program were reviewed. This review confirmed that the process for obtaining approval of a revision was less complex than that for obtaining approval of a new document. The review provided no new basis for choosing between MIL-P-28700 and MIL-H-46855B. The processes for creating a new, and for modifying an existing, military standard or military specification are presented on the charts in Appendix E. The charts are a product of this effort.

In the absence of compelling advantages to choosing MIL-P-27800 over MIL-H-46855B for modification, or vice versa, MIL-P-27800 was given first choice with MIL-H-46855B a close second. The choice of MIL-P-27800 would put manpower and personnel on a par with other MANPRINT domains in having a standardization document devoted exclusively to the topic. This is not necessarily an advantage but has the appeal of parallelism.

Informal coordination between representatives of the Army and the Navy indicated that the Navy was unlikely to interpose an objection to revising the specification or to converting it to a military standard, the format currently more appropriate to the intended purpose of the revised document. It was suggested that the Navy might be willing to transfer proponentcy of the document to the Army.

CONCLUSIONS

Based on the foregoing, it was concluded that:

- a. MIL-P-28700 should be converted to a military standard, including the eleven manpower and personnel requirements (Appendix C), and be completely rewritten in a manner suitable for tri-service use.
- b. The following three draft proposed DIDs (Appendix C) should be submitted for approval along with revised MIL-P-28700:
 - (1) Manpower and Personnel Program Plan (Append. C, p. C-3)
 - (2) Task Performance Capability Analysis Report (Append. C, p. C-25)
 - (3) Qualitative and Quantitative Personnel Requirements Information (QQPRI) and Training Requirements Report (Append. C, p. C-29)
- c. The following two DIDs should be proposed for cancellation and replacement by b, (3) above:
 - (1) Personnel and Training Requirements. DI-H-1300, 15 December 1969
 - (2) Qualitative and Quantitative Personnel Requirements Information (QQPRI), Part I: Field and Organizational Maintenance. DI-H-3253, 24 August 1970.
- d. In the event that the following two DIDs are not approved as part of MIL-H-1478, Task Analysis, they should be submitted for approval along with revised MIL-P-28700:
 - (1) Task Analysis Report (Append. C, p. C-15)
 - (2) Task Inventory Report (Append. C, p. C-11)
- e. As a second choice, MIL-H-468558 may be modified as an alternative to revising MIL-P-28700. Specific details for implementing this second choice are presented in the charts of Appendix D.
- f. The charts in Appendix E provide flow diagrams for the process of seeking approval of DOD standardization documents. For a revised document, begin on page E-5 thence to page E-3 and E-4. The processes are described in detail in Bibliography items 9, 10, 12, 36, 37, 42, and 43.

REFERENCES

1. Acquisition Management Systems and Data Requirements Control List (Department of Defense 5010.12-L). (1988)
2. Department of Defense Index of Specifications and Standards. (1987 and Supplement May 1988)
3. Human Engineering Requirements for Military Systems, Equipment and Facilities (Military Specification MIL-H-46855B, Amendment 2). (1984)
4. Integrated Logistics Support Program Requirements (Proposed Military Standard 1369A). (May 1988)
5. Logistics Support Analysis (Military Standard 1388-1A). (1983)
6. Manpower, Personnel and Training (MPT) Data Requirements Study: Final Report. Engineering Practice Study, Department of Defense Standardization Project NO. HFAC-0009. (1985)
7. Myers, L.B., Tijerina, L. and Geddie, J.C. (1987). Proposed Military Standard for Task Analysis (TM 13-87). Aberdeen Proving Ground, MD: U.S. Army Human Engineering Laboratory. (MIL-STD-1478)
8. Personnel and Training Requirements (Data Item Description DI-H-1300). (1969)
9. Personnel Planning Data for Naval Systems (Military Specification MIL-P-28700). (1970)
10. Qualitative and Quantitative Personnel Requirements Information (QQPRI), Part I: Field and Organizational Maintenance (Data Item Description DI-H-3253). (1970)

APPENDIX A
BIBLIOGRAPHY

1. Acquisition and Management of Integrated Logistic Support for Systems and Equipment (Department of Defense (DOD) Directive 5000.39) (1983).
2. Acquisition Streamlining (Department of Defense (DOD) Directive 5000.43) (1986).
3. Application of Specifications, Standards, and Related Documents in the Acquisition Process (Army Regulation 700-70) (1983).
4. Army Data Management Program (US Army Materiel Command (Supplement 1 to AR 700-51) (1973).
5. Army Data Management Program (Army Regulation 700-51) (1973).
6. Basis of Issue Plan (BOIP) and Qualitative and Quantitative Personnel Requirements Information (QQPRI) (Army Regulation 71-2) (1985).
7. Cherry, V.P., Promisel, P.M. and Miles, J.L., Jr. (1984). Human Factors, Manpower, Personnel and Training Clauses for the Concept Exploration and the Demonstration and Validation Requests for Proposal (ARI Research Product 84-24).
8. Contract Training Programs (Military Standard 1379B) (1981).
9. Data Item Descriptions (DIOS), Preparation of (Military Standard 963A) (1986).
10. Defense Standardization and Specification Program (Army Regulation 700-47) (1980).
11. Defense Standardization and Specification Program (Department of Defense Directive 4120.3) (1979)
12. Defense Standardization Manual (Department of Defense 4120.3-M) (1985).
13. DOD Requirements for a Logistic Support Analysis Record (Military Standard 1388-2A) (1984).
14. Enlisted Career Management Field and Military Occupational Specialties (Army Regulation 611-201) (1984).
15. "I Am The American Soldier." (Army Field Circular 21-451) (1986).
16. Including MANPRINT in Requirements Documents (Letter from Headquarters, US Army Training and Doctrine Command, 3 June 1986).
17. Integrated Logistic Support (Army Regulation 700-127) (1987).
18. Integrated Logistic Support: Developmental Supportability Test and Evaluation Guide (Department of the Army Pamphlet 700-50) (1984).

19. Logistic Support Analysis (LSA) Primer (US Army Materiel Command Pamphlet 700-22) (1986).
20. Management of Technical Data (Department of Defense Instruction 5010.12) (1968).
21. Manpower and Personnel Integration (MANPRINT) (Letter from Headquarters, U.S. Army Materiel Command (AMCPS-S), 14 June 1985).
22. Manpower and Personnel Integration (MANPRINT) (US Army Materiel Command Circular 602-1) (1987).
23. Manpower and Personnel Integration (MANPRINT) (US Army Training and Doctrine Command Circular 602-XXX, (17 September 1985).
24. Manpower and Personnel Integration (MANPRINT) Guide (US Army Training and Doctrine Command Pamphlet 602-XX, draft) (30 January 1988).
25. Manpower and Personnel Integration (MANPRINT) in Materiel Acquisition Process (Army Regulation 602-2) (1987).
26. Manpower, Personnel, Training and Safety in the Defense System Acquisition Process (Department of Defense Directive 5000.xx, draft) (September 1988).
27. Manpower Requirements Criteria (MARC) - Tables of Organization and Equipment (Army Regulation 570-2) (1987).
28. MANPRINT Guidance Letter for Technology Developers (Draft letter from US Army Materiel Command) (30 June 1986).
29. MANPRINT Handbook for Nondevelopmental Item (NDI) Acquisition (US Army Materiel Command Pamphlet 602-2) (1988).
30. MANPRINT Handbook for RFP Development (US Army Materiel Command Pamphlet 602-1) (1987).
31. MANPRINT On-Line: (Letter from U.S. Army soldier Support Center - National Capitol Region, 29 April 1987).
32. MANPRINT Tools for BOIP and QOPRI Development (Letter from HQDA, (DAMO-FDR), 26 July 1986).
33. Materiel Acquisition Handbook (US Army Materiel Command/US Army Training and Doctrine Command Pamphlet 70-2) (1987).
34. Miles, J.L., Jr. and Davis, R.N., Jr. (1984). Acquiring Weapons Compatible with Soldier Abilities: Policy Implications from Reverse Engineering (ARI Research Report-unnumbered).
35. McCommons, R.B. (1987). Human Factors Engineering Data Management Handbook (TM6-87). Aberdeen, MD: US Army Human Engineering Laboratory.
36. Military Specifications and Associated Documents, Preparation of (Military Standard 961B) (1985).

37. Military Standards and Handbooks, Preparation of (Military Standard 962A) (1984).
38. Nondevelopmental Item Acquisition (US Army Materiel Command/US Army Training and Doctrine Command Pamphlet 70-7, draft) (7 June 1986).
39. Office, Deputy Chief of Staff for Personnel, Headquarters, Department of the Army. (1987). MANPRINT In The Source Selection Process. Washington, D.C..
40. Office, Deputy Chief of Staff for Personnel, Headquarters, Department of the Army. (1988). MANPRINT Primer. Washington, D.C.
41. Office, Deputy Chief of Staff for Personnel, Headquarters, US Air Force. (1987). RAMPARTS Handbook: A Blueprint for Enhanced MPTS Planning. Washington, D.C..
42. Specification Practices (Military Standard 490A) (1985).
43. Standardization Directory (Department of Defense SD-1) (1987).
44. Systems Acquisition Policy and Procedures (Army Regulation 70-1, draft) (23 February 1988).
45. Test and Evaluation (Department of Defense Directive 5000.3) (1986).
46. Test and Evaluation Master Plan (TEMP) Guidelines (Department of Defense Manual 5000.3-M-1), (1986).
47. Title 10, U.S. Code, Chapter 144, Section 2434 (Requirement for Manpower Estimate Report).
48. Transition from Development to Production (Department of Defense Directive 4245.7) (1984).
49. Transition from Development to Production (Department of Defense Manual 4245.7-M) (1985).
50. US Army Soldier Support Center- National Capital Region. (1987). Early Comparability Analysis (ECA), Procedural Guide. Alexandria, VA.
51. US Army Soldier Support Center - National Capitol Region. (April 1987). System MANPRINT Management Plan (SMMP) Procedural Guide (Draft). Alexandria, VA.
52. US Army Soldier Support Center - National Capitol Region. (April 1987). MANPRINT Risk Assessment. Alexandria, VA.

DATA ITEM DESCRIPTIONS (DIDs)

53. Audiovisual Aids Index for Training Equipment and Training Courses. DI-H-7073, 18 February 1981.
54. Audiovisual Aids, Master Reproducibles and Review Copies for Training Equipment and Training Courses. DI-H-7072, 18 February 1981.

55. Comparative Analysis Report. DI-S-7116, 11 April 1983.
56. Coordinated Test plan. DI-T-1900, 15 December 1969.
57. Critical Task Analysis Report. DI-H-7055, 1 June 1979.
58. Depot Maintenance Study. DI-S-1815, 15 December 1969.
59. Early Fielding Analysis Report. DI-S-7118, 11 April 1983.
60. Human Engineering Design Approach Document-Maintainer. DI-H-7057, 1 June 1979.
61. Human Engineering Design Approach Document - Operator. DI-H-7056, 1 June 1979.
62. Human Engineering Program Plan (Modified). DI-H-7051, 1 June 1979.
63. Human Engineering Program Plan, DI-H-7051, 1 June 1979.
64. Human Engineering Progress Report. DI-H-7059, 1 June 1979.
65. Human Engineering System Analysis Report. DI-H-7054, 1 June 1979.
66. Human Engineering Test Plan. DI-H-7053, 1 June 1979.
67. Human Engineering Test Report. DI-H-7058, 1 June 1979.
68. Human Factors Design Analysis Report. DI-HFAC-80242, 1 October 1986.
69. Human Factors Development Plan. DI-HFAC-80240, 1 October 1986.
70. Human Factors Technical Report. DI-HFAC-80241, 1 October 1986.
71. Instructor/Lesson Guides - Training Courses. DI-H-7070, 18 February 1981.
72. Instructor's Utilization Handbook for Simulation Equipment. DI-H-7076, 18 February 1981.
73. Integrated Support Plan (ISP). DI-L-30318, 1 August 1972.
74. Integrated Test Plan. DI-T-1904, 15 December 1969.
75. Logistic Support Analysis Plan. DI-L-7017A, 11 April 1983.
76. Logistic Support Analysis Record (LSAR) Data. DI-ILSS-80114, 21 February 1986.
77. LSA-002, Personnel and Skill Analysis Report. DI-L-7147, 23 July 1984.
78. LSA-014, Training Task List Report. DI-L-715, 23 July 1984.
79. LSA-019, Maintenance Task Analysis Validation Summary Report. DI-L-7161, 23 July 1984.

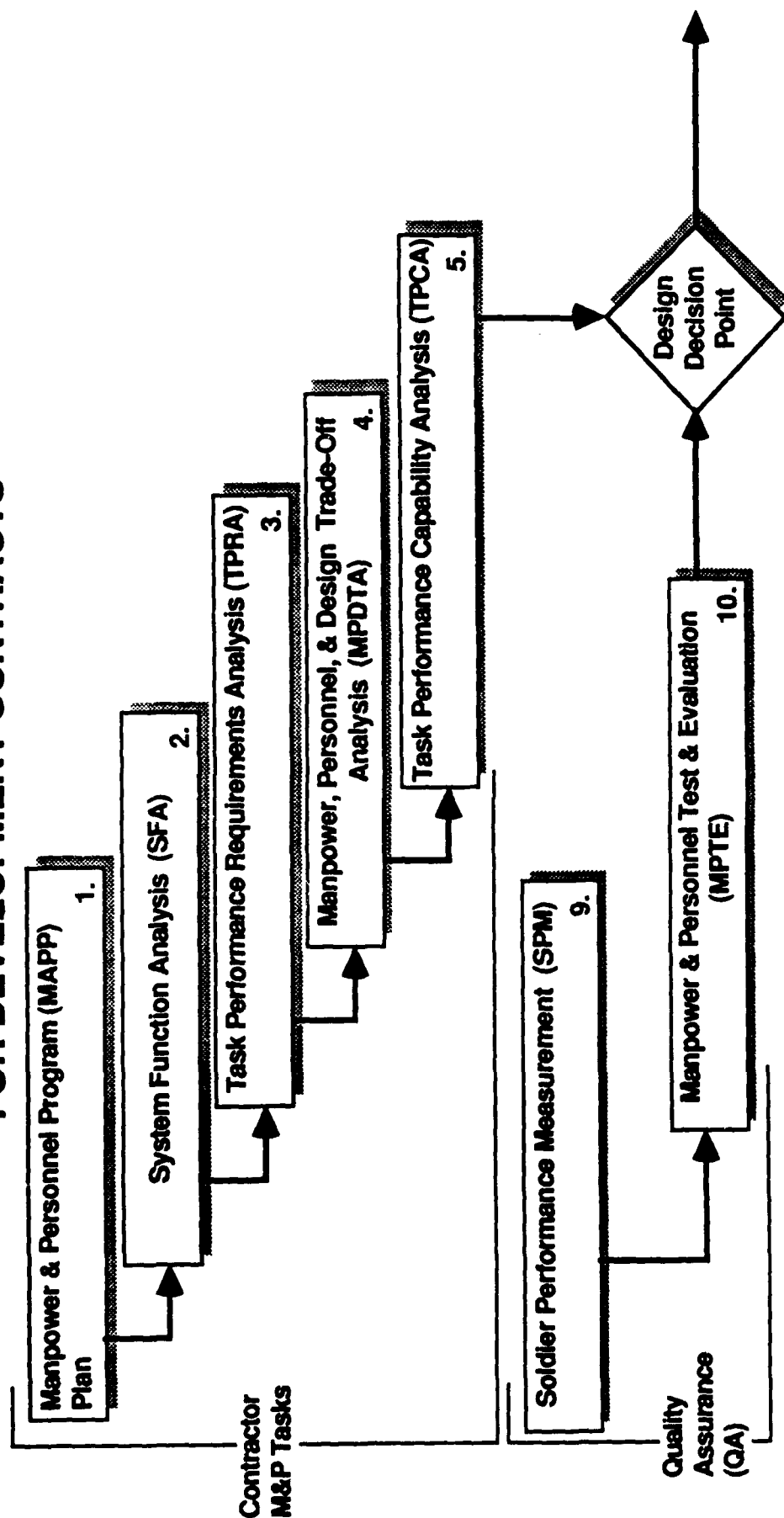
80. LSA-075, LSAR Manpower Personnel Integration (MANPRINT) Summary. DI-ILSS-80790, 20 January 1987.
81. Manpower, Personnel and Training Analysis Report. DI-ILSS-80077, 10 December 1985.
82. Objectives Hierarchies Report. DI-H-25715B, 30 June 1986.
83. On-the-job Training Handbook. DI-H-7077, 18 February 1981.
84. Personnel Performance Profiles. DI-ILSS-80078, 10 December 1985.
85. Personnel Planning Report. DI-HFAC-80243, 1 October 1986.
86. Personnel Sub-system/Human Factors Development Plan. DI-H-3251, 1 November 1971.
87. Phased Support Plan. DI-ILSS-80037A, 8 June 1987.
88. Plan, Integrated Logistic Support (ILSP). UDI-L-21012, 31 July 1972.
89. Plan, Integrated Logistic Support (ILSP). UDI-L-22316A, 28 May 1974.
90. Plan, Integrated Logistic Support (ILSP) Ground Support Equipment Section. UDI-A-21190, 31 July 1972.
91. Product Assurance Design and Program Review Report. DI-R-1703, 15 December 1969.
92. Product Assurance Test, Demonstration and Evaluation Plan. DI-R-1701, 15 December 1969.
93. Proposal, Integrated Logistic Support Section. UDI-L-21011, 31 July 1972.
94. Reliability Centered Maintenance. DI-R-3522B, 13 May 1985.
95. Scientific and Technical Reports. DI-S-4057, 17 October 1973.
96. Student and Training Course Evaluation Forms. DI-ILSS-80046, 10 September 1985.
97. Student Entry Level Report. DI-H-25714B, 1 April 1985.
98. Student's Training Course Guide. DI-H-7071, 18 February 1981.
99. Supportability Assessment Plan. DI-S-7120, 11 April 1983.
100. System/Design Trade Study Reports. DI-S-3606, 1 November 1971.
101. Task Analysis report. DI-H-xxxx (HEL Draft Proposed).
102. Task and Skill Analysis report. DI-H-7068, 18 February 1981.
103. Task Inventory Report. DI-H-xxx, (HEL Draft Proposed).

104. Task Listing Report. DI-H-25713B, 1 April 1985.
105. Technical Hands-On Training System Packets. DI-H-7078, 18 February 1981.
106. Tests for Measurement of Student Achievement. DI-H-7074, 18 February 1981.
107. Training and Training Equipment Plan. DI-H-7067, 18 February 1981.
108. Training Course Proposal. DI-H-7067, 18 February 1981.
109. Training Course/Curriculum Outlines. DI-H-7069, 18 February 1981.
110. Training Development and Support Plan. DI/MGMT-80476, 26 October 1987.
111. Training Path System. DI-ILSS-80143, 7 April 1986.
112. Training Plan. DI-ILSS-80143, 7 April 1986.
113. Training Program and Training Equipment Plan. DI-ILSS-80076, 10 December 1985.
114. Training Support Requirements Report. DI-H-25721B, 1 April 1985.
115. Use Study Report, DI-S-7115, 11 April 1983.

APPENDIX B

EVENT PHASED MANPOWER AND
PERSONNEL REQUIREMENTS FOR
DEVELOPMENT CONTRACTS

EVENT PHASED MANPOWER & PERSONNEL REQUIREMENTS FOR DEVELOPMENT CONTRACTS



B-2

Traditional: Program Initiation

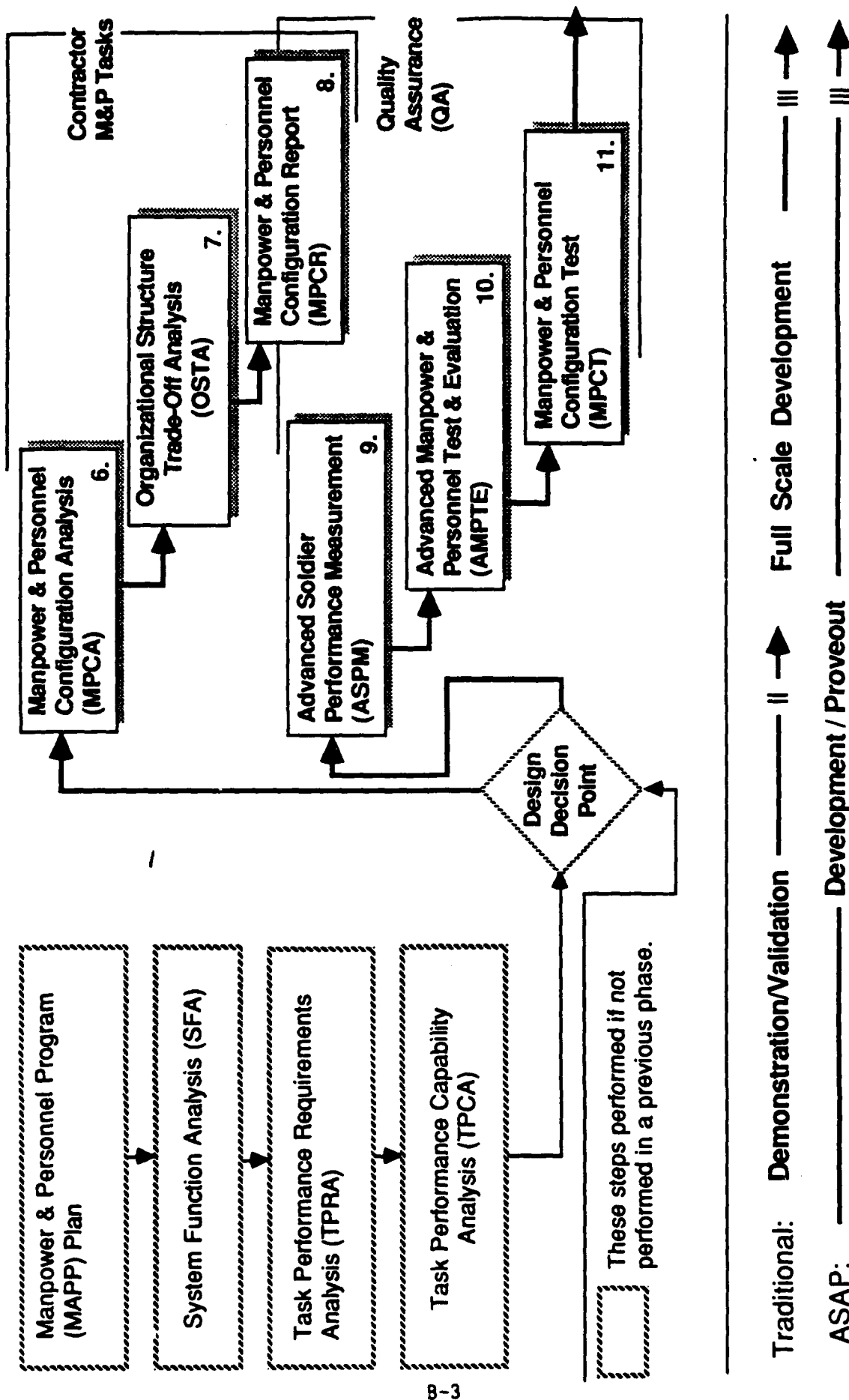
— 0 —> Concept Exploration —> | —>

ASAP: Requirements & Technology Base

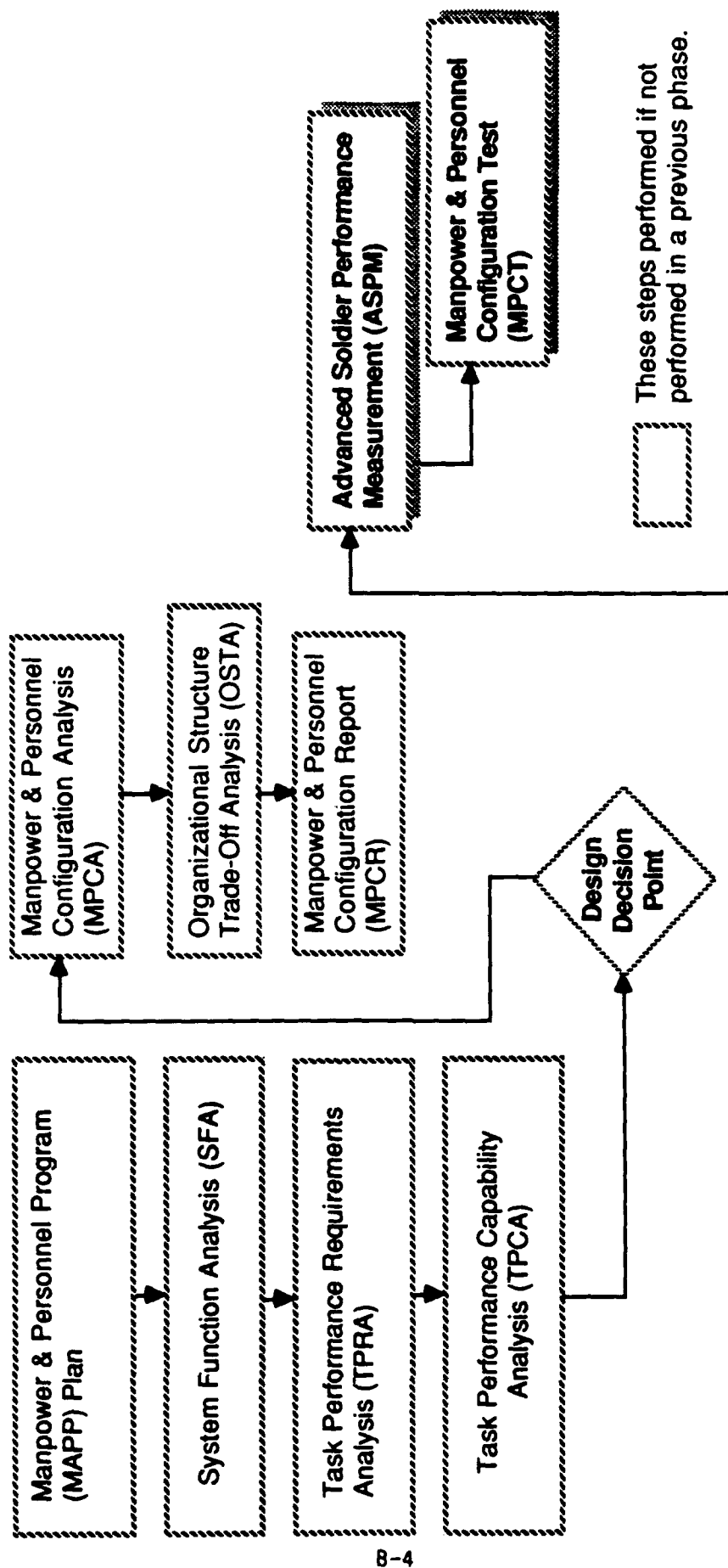
MNS & O & O

—> Proof of Principle —> I/I —>

EVENT PHASED MANPOWER & PERSONNEL REQUIREMENTS FOR DEVELOPMENT CONTRACTS

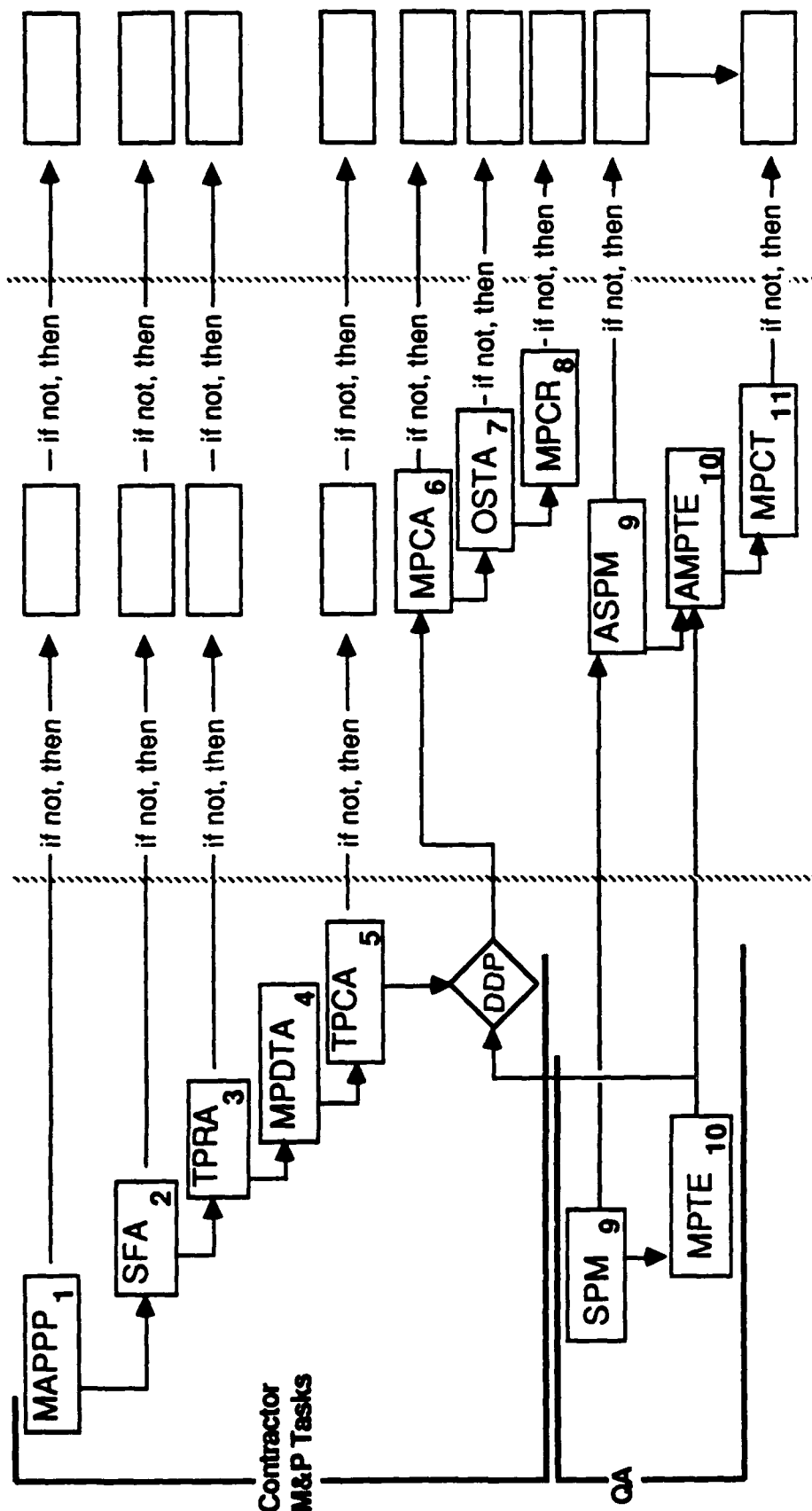


EVENT PHASED MANPOWER & PERSONNEL REQUIREMENTS FOR DEVELOPMENT CONTRACTS

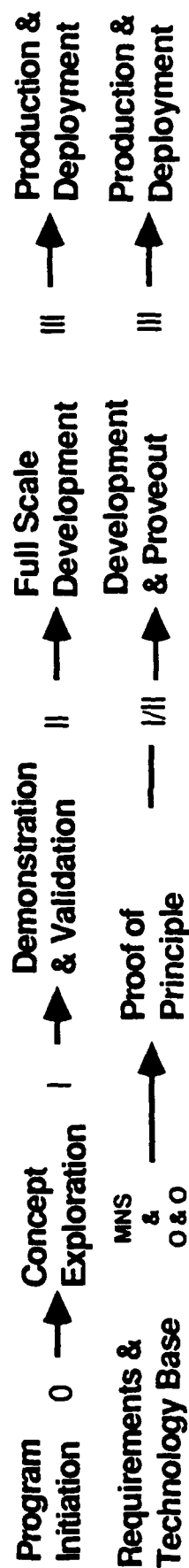


Traditional/ASAP: Production and Deployment

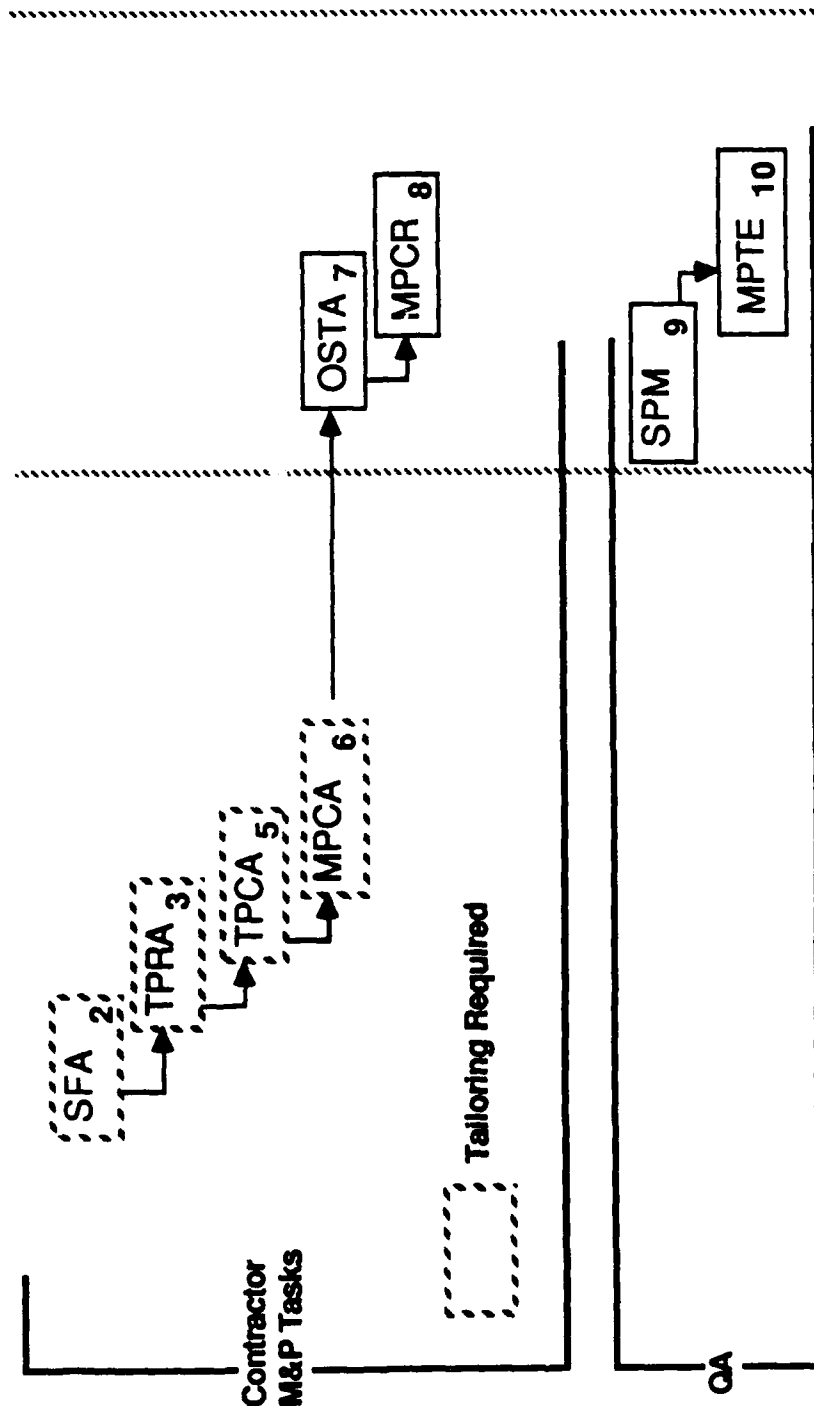
OVERVIEW OF EVENT PHASED MANPOWER & PERSONNEL REQUIREMENTS FOR DEVELOPMENT CONTRACTS



B-5



MANPOWER & PERSONNEL REQUIREMENTS FOR NONDEVELOPMENT ITEM (NDI) CONTRACTS



B-6

MARKET SURVEILLANCE	MARKET INVESTIGATION	INDEPENDENT EVALUATION PLAN	INDEPENDENT EVALUATION REPORT	Development	Production & Deployment
Requirements & Technology Base	MNS & O&O	Proof of Principle	—	I/II —> & Proveout	III —> Deployment

APPENDIX C

MANPOWER AND PERSONNEL
REQUIREMENTS FOR DEVELOPMENT CONTRACTS

(Eleven specific data needs expressed in
language suitable for use
in standardization documents.)

Manpower and Personnel Requirements for Development Contracts

1. Manpower and Personnel Program Plan

A Manpower and Personnel Program (MAPP) Plan shall be prepared and shall include, but not be limited to, the following:

- a. A description of the plans, analyses, tests and evaluations through which the contractor and subcontractors will address manpower and personnel issues and their impact on equipment design, meet manpower and personnel constraints, and generate manpower and personnel information required by the contract.
- b. A description of the procedures for integrating Manpower and Personnel Program activities with activities covered in the Human Engineering Program Plan and the Training Program and Training Equipment Plan.
- c. A description of the procedures for multiple use of common data, and procedures for coordination and avoidance of duplication of activities in the Logistics Support Analysis (LSA) and Integrated Logistic Support (ILS) program (e.g. Task analysis results).

NOTE: The Manpower and Personnel Program Plan may be prepared as a separate entity or may be a section of the Manufacturers MANPRINT Management Plan (MMMP), if the MMMP is a contract requirements. DID DI-H-7051, Human Engineering Program plan (Modified), applies to the MMMP. DID-H- (Manpower and Personnel Program Plan), applies to the Manpower and Personnel Program Plan. Deliverable data identified on the DD Form 1423 shall be prepared in accordance with instructions specified in these DIDs.

DATA ITEM DESCRIPTION

Form Approved
OMB No. 0704-0188
Exp. Date: Jun 30, 1995

1. TITLE

Human Engineering Program Plan (Modified)

2. IDENTIFICATION NUMBER

DI-H-7051

3. DESCRIPTION/PURPOSE

The Manufacturer's MANPRINT Management Plan (MMMP) is the single document which describes the contractor's entire MANPRINT program, identifies its elements and explains how the elements will be managed. This document is used by the procuring activity as the principal basis for approval of the contractor's program and as one basis for review of the contractor's progress.

4. APPROVAL DATE

(YYMMDD)
79/06/01

5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)

ARMY/MIRADCOM

6a. DTIC REQUIRED

6b. GIDEP REQUIRED

7. APPLICATION/INTERRELATIONSHIP

The Manufacturer's MANPRINT Management Plan is related to DI-H-7051, Human Engineering Program Plan (unmodified); DI-H-7066, Training and Training Equipment Plan; DI-S-3606(c) System/Design Trade Study Reports, Personnel Trade-Off Analysis Report; and DI-SAFT-80100, System Safety Program Plan.

8. APPROVAL LIMITATION

9a. APPLICABLE FORMS

MIL-H-46855B
MIL-STD-1472

9b. AMSC NUMBER

10. PREPARATION INSTRUCTIONS

10.1 General. The MMMP shall describe an integrated effort within the total project and shall contain specific information to show how and when the contractor shall satisfy all MANPRINT performance, design and program requirements specified in the contract.

10.2 Format and Content Requirements. The MMMP shall consist of the following:

(1) Table of Contents, List of Illustrations and Introduction.

(2) Organization. This section shall identify and describe the contractor's primary organizational element responsible for complying with MANPRINT requirements. The functions and internal structure of this element shall be defined. Structural definition shall include the number of proposed personnel on an annual basis and summary job descriptions for each person. In addition, the relationships of this element to other organizational elements responsible for areas impacted by MANPRINT, such as those charged with equipment and software design, test and evaluation, integrated logistic support and other engineering specialty programs (such as reliability, maintainability, survivability/vulnerability, and transportability) shall be fully explained. The authority delegated to each of the elements shall be stated in explaining the relationships. This section shall also describe the methods by which the contractor shall ensure that compatibility is continuously maintained between the design of system hardware and software (including support and training equipment), human performance requirements, manpower and personnel requirements, training requirements, system safety requirements, and health hazard limitations.

(3) MANPRINT in Subcontractor Efforts. If any work related to system components or software having human interface safety and/or health hazard implications is to be performed under subcontract, the subcontractor's organizational element responsible for

10. PREPARATION INSTRUCTIONS (continued)

MANPRINT shall be described to the same extent as the prime contractor's MANPRINT organization is covered. A copy of the MANPRINT requirements proposed for inclusion in each of these subcontracts shall be provided. The method(s) by which the prime contractor monitors subcontractor compliance shall be fully described.

(4) MANPRINT in System Analysis. This section shall identify those MANPRINT efforts in system analysis (or, where contractually required, in system engineering), which are contractually applicable and the organizational element(s) responsible for their performance. MANPRINT participation in system mission analysis, determination of system functional requirements and capabilities, allocation of system functional requirements to human/hardware/software, development of system functional flows and performance of system effectiveness studies shall be fully described. Any data required from the procuring activity shall be described.

(5) MANPRINT in Equipment Detail Design. This section shall describe the effort in equipment detail design to ensure compliance with requirements specified by the contract. MANPRINT participation in studies, tests, mock-up evaluations, dynamic simulation, detail drawing reviews, systems design reviews and system/equipment/component design and performance specification preparation and reviews shall be fully described.

(6) MANPRINT in Test and Evaluation. This section shall describe MANPRINT test and evaluation as an integrated effort within the contractor's total test and evaluation program and shall contain specific information to show how and when the contractor shall satisfy test and evaluation requirements of the contract. Design milestones shall be identified at which MANPRINT tests are to be performed to assess compatibility among human performance requirements, personnel aptitude and skill requirements, training requirements, equipment design aspects of personnel equipment/software interfaces, system safety, and elimination and/or control of health hazards. Major test and demonstration objectives shall be identified and proposed test methods shall be described. This section shall also identify the MANPRINT personnel involved in test and evaluation, and a summary of the MANPRINT test schedule. The summary test schedule shall depict major MANPRINT tests, evaluations and demonstrations in relationship to major project milestones such as 90 percent design release, project level design reviews, first article demonstration tests and commencement of procuring activity testing.

(7) MANPRINT Deliverable Data Products. This section shall identify and briefly describe each MANPRINT deliverable data product specified in the contract.

(8) Time-Phase Schedule and Level of Effort. This section consists of a milestone chart which identifies efforts to be accomplished in each of the six separate MANPRINT domains.

(9) Related Plans. This section shall identify and describe related plans for the six separate MANPRINT domains (Manpower, Personnel, Training, Human Factors Engineering, System Safety, and Health Hazard Assessment). The Human Engineering Program Plan (DI-H-7051), the Training and Training Equipment Plan (DI-H-7066) and the System Safety Program Plan (DI-SAFT-80100) may be included in the MMMP by reference.

DATA ITEM DESCRIPTION		Form Approved OMB No. 0704-0188	
2. TITLE Manpower and Personnel Program Plan		1. IDENTIFICATION NUMBER	
3. DESCRIPTION/PURPOSE 3.1 This Manpower and Personnel Program (MAPP) Plan is the document which describes the contractor's program to address manpower and personnel issues and their impact on equipment design. This document is the contractor's description of manpower and personnel analyses, tests and evaluations to optimize human-machine interface. The procuring activity will use this document to approve the contractor's program and to review the contractor's progress.			
4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR) A DAPE-MR	6a. DTIC APPLICABLE	6b. GIDEP APPLICABLE
7. APPLICATION/INTERRELATIONSHIP 7.1 The Manpower and Personnel Program (MAPP) Plan is related to DI-H-7051, Human Engineering Program Plan (Modified). 7.2 This DID contains the format and content preparation instructions for the plan described by x.x.x of MIL-STD-xxx. 7.3 It is not intended that all the requirements contained herein should be applied to every program or program phase. Portions of this DID are subject to deletion tailoring depending upon the program phase in which it is applied in the contract.			
8. APPROVAL LIMITATION		9a. APPLICABLE FORMS	9b. AMSC NUMBER
10. PREPARATION INSTRUCTIONS 10.1 <u>Reference Documents</u> . The applicable issue of the documents cited herein, including their approval dates and dates of any applicable amendments, notices, and revisions, shall be as specified in the contract. 10.2 <u>General</u> . The MAPP shall describe in the contractor's format an integrated effort within the total project to show how and when the contractor will perform the manpower and personnel program requirements specified in the contract. The MAPP Plan shall include: a. A description of the plans, analyses, tests and evaluations by which the system manpower and personnel issues are to be addressed. b. The contractor's understanding and commitment to recommend system design changes to meet the government provided manpower and personnel constraints. c. The procedures for integrating the MAPP requirements with the training and Human Factors Engineering plans and activities. d. The manner to preclude duplication of data or efforts with programs such as Logistics Support Analysis (LSA) of Integrated Logistic Support (ILS). (Continued on Page 2)			
11. DISTRIBUTION STATEMENT Approved for public release; distribution is unlimited			

10. Preparation Instructions (Continued)

10.2.2 Organization. This section shall identify and describe the contractor's primary organizational element responsible for complying with Manpower and Personnel requirements. The functions and internal structure of this element shall be defined. Structural definition shall include the number of proposed personnel on an annual basis and summary job descriptions for each person. In addition, the relationships of this element to other organizational elements responsible for areas impacted by equipment and software design, test and evaluation, integrated logistic support and other engineering specialty programs (such as reliability, maintainability, survivability/vulnerability, and transportability) shall be fully explained. The authority delegated to each of the elements shall be stated in explaining the relationships. This section shall also describe the methods by which the contractor shall ensure that compatibility is continuously maintained between the design of system hardware and software (including support and training equipment), human performance requirements, health hazard limitations, and manpower and personnel requirements.

10.2.3 Subcontractor Efforts. If any work related to system components or software having manpower or personnel implications is to be performed under subcontract, the subcontractor's organizational element responsible for manpower and personnel shall be described to the same extent as the prime contractor's organization is covered.

10.2.4 Plan Consolidation. This Manpower and Personnel Program Plan may be prepared as a separate plan or be a section of a Manufacturer's MANPRINT Management Plan (MMMP), if the MMMP is a contract requirement. DIO DI-H-7051, Human Engineering Program Plan (Modified), applies to the MMMP.

10.2.5 Manpower and Personnel Issues. Discuss the manpower and personnel issues associated with the system components and the kinds of analyses planned to determine the manpower and personnel impacts on operational, maintenance and support functions for each design approach.

10.2.6 Approach to Tasks. Describe the allocation of functions and inventory of tasks that people must perform for each design approach.

10.2.7 Performance Requirements. Describe the analysis to show performance requirements bounded by minimum acceptable accuracy and maximum acceptable time for operator, maintainer and support personnel. Identify the method by which critical tasks will be evaluated.

10.2.8 Design Trade-off Analysis. Describe the analyses that identify alternative design concepts that maximize task and system performance levels while remaining within the manpower and personnel constraints provided by the procuring activity. State how each design approach will receive a human performance capability analysis.

10.2.9 Optimum Design. Describe the procedures proposed to test and evaluate the sensitivity analyses relating design alternatives and effectiveness with varying manpower and personnel factors.

10.3 Time-Phase Schedule and Level of Effort. Provide a milestone chart which identifies each separate manpower and personnel analysis, test and evaluation. State the man-month level of effort for each task.

10.3.9 Optimum Design. Describe the procedures proposed to test and evaluate the sensitivity analyses relating design alternatives and effectiveness with varying manpower and personnel factors.

10.4 Time-Phase Schedule and Level of Effort. Provide a milestone chart which identifies each separate manpower and personnel analysis, test and evaluation. State the man-month level of effort for each task.

Manpower and Personnel Requirements for Development Contracts

2. System Function Analysis

A System Function Analysis (SFA) shall be conducted for each materiel design concept under consideration. The SFA shall include, but not be limited to:

- a. A description of each operational, maintenance, and support function necessary for system performance and availability.
- b. Trade-off analyses assessing alternative allocations of functions among personnel, personnel and machine, and machine. The analyses shall include automated and machine-aided functions.
- c. An inventory of the tasks that personnel must perform for each design concept. All tasks shall be covered, including all physical, information processing, and communications tasks. The task inventory shall be prepared in accordance with para 5.1 of MIL-STD-1478, Task Analysis.

NOTE: The SFA shall be conducted in accordance with paragraph 3.2.1.1 of MIL-H-46855B. DIO DI-H-7054, Human Engineering System Analysis Report, applies to these requirements. DI-H-(Task Inventory Report)* specifically applies to reporting the inventory of tasks. Deliverable data identified on the DD Form 1423 shall be prepared in accordance with instructions specified in these DIOs.

*from MIL-STD-1478

DATA ITEM DESCRIPTION		2. IDENTIFICATION NO(S).	
		AGENCY	NUMBER
1. TITLE Human Engineering System Analysis Report		DOD	DI-B-7054
3. DESCRIPTION/PURPOSE This report describes the human engineering efforts conducted as part of system analysis and presents results. The data are used by the procuring activity to evaluate the appropriateness and feasibility of system functions and roles allocated to operators and maintainers.		4. APPROVAL DATE 1 June 1979	
		5. OFFICE OF PRIMARY RESPONSIBILITY ARMY/MIRADCOM	
		6. DOC REQUIRED	
		8. APPROVAL LIMITATION	
7. APPLICATION/INTERRELATIONSHIP This DID replaces UDI-H-21386 and UDI-H-21387. This DID is primarily applicable to work tasks delineated in paragraph(s) 3.2.1 through 3.2.1.2 of MIL-H-46855B.		9. REFERENCES (MANDATORY AS CITED IN BLOCK 10) MIL-H-46855B	
		MCSL NUMBER(S)	
10. PREPARATION INSTRUCTIONS			
<p>10.1 <u>General</u>. The Human Engineering System Analysis Report (HESAR) shall be prepared which describes human engineering analyses of system functions, system information flow and processing requirements and operator/maintainer capabilities which are conducted to determine plausible human roles.</p> <p>10.2 <u>Content Requirements</u>. The HESAR shall consist of the following information:</p> <p>1) <u>System Objective(s)</u>. In accordance with information provided by the procuring activity and/or contractor studies, the system objective(s) shall be described. If the objective(s) are to be met by the system operating in conjunction with other systems not within the scope of the contract, the following shall also be described:</p> <p>a) The overall (or higher level) objective(s) to be met through combined operation of systems</p> <p>b) The sub-objective(s) to be met by the system being developed under the contract</p> <p>c) interactions required between systems to meet the overall objective(s).</p> <p>2) <u>System Mission(s)</u>. In accordance with information provided by the pro-</p>			

DD FORM 1664
JUN 68

PAGE 1 OF 2 PAGES

10. PREPARATION INSTRUCTIONS (continued)

curing activity and/or based upon contractor studies, the system mission(s) shall be described. The mission description(s) shall describe the context(s) within which the system will meet its objective(s); e.g., geography, mission time constraints, weather, day/night, humidity, sea state, terrain roughness, vegetation density, enemy force concentration, enemy weapons/countermeasures capabilities, enemy order of battle, presence/absence of other cooperating systems, etc.

3) System Functions. In accordance with information provided by the procuring activity and/or based on contractor studies, the system functions (which must be performed to meet the system objective(s) within the mission context(s)) shall be described.

4) Allocation of System Functions. Analyses conducted in accordance with paragraph 3.2.1.1 of MIL-H-46855B shall be described. Specifically, the following analyses and the results of these analyses shall be presented:

a) Information Flow and Processing (paragraph 3.2.1.1.1 of MIL-H-46855B)

b) Estimates of Potential Operator/Maintainer Processing Capabilities (paragraph 3.2.1.1.2 of MIL-H-46855B)

c) Allocation of Functions (paragraph 3.2.1.1.3 of MIL-H-46855B)

5) Equipment Identification. In accordance with information provided by the procuring activity and based upon contractor studies conducted in accordance with paragraph 3.2.1.2 of MIL-H-46855B, the selected design configuration shall be described.

10.3 Format Requirements. The HESAR shall be prepared in contractor format.

★ U.S. GOVERNMENT PRINTING OFFICE: 1979-403-922/5041

DATA ITEM DESCRIPTION		Form Approved OMB No. 0704-0188 Exp. Date Jun 30 1986									
1. TITLE TASK INVENTORY REPORT		2. IDENTIFICATION NUMBER									
3. DESCRIPTION/PURPOSE 3.1 A task inventory is a comprehensive listing of all human tasks associated with a system, equipment, or facility. A task inventory succinctly describes all tasks that might be further analyzed and so drives any subsequent task analysis effort. It also allows for efficient organization of tasks into jobs and duties. (Continued on page 2)											
4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTIC REQUIRED	6b. GIDEP REQUIRED								
7. APPLICATION/INTERRELATIONSHIP 7.1 This Data Item Description (DID) contains the format and content preparation instructions for the task inventory data generated under the work tasks described in DRAFT MIL-STD-XXXX, Task Analysis Standard. 7.2 This DID is applicable to the acquisition of military systems, equipment, and facilities. (Continued on page 2)											
8. APPROVAL LIMITATION	9a. APPLICABLE FORMS	9b. AMSC NUMBER									
10. PREPARATION INSTRUCTIONS 10.1 <u>Source document.</u> The applicable issue of the documents cited herein, including their approval dates and dates of any applicable amendments and revisions, shall be as reflected in the contract. 10.2 <u>Guidance.</u> The Task Inventory Report (TIR) shall be based on the Task Analysis Standard, DRAFT MIL-STD-XXXX, Methods appropriate to the development of a Task Inventory are described in DRAFT MIL-HDBK-XXXX. 10.3 <u>Content.</u> The Task Inventory Report shall contain the following information items, either numbered or arranged (e.g., by outline or diagram) to show their relationship to each other: <table border="0"> <tr> <td>1. Mission</td> <td>5. Duties</td> </tr> <tr> <td>2. Scenarios/conditions</td> <td>6. Tasks</td> </tr> <tr> <td>3. Requirements</td> <td>7. Subtasks</td> </tr> <tr> <td>4. Jobs</td> <td>8. Task elements</td> </tr> </table> 10.4 <u>Format.</u> The Task Inventory Report shall incorporate both graphic and textual formats. Each of these formats is described below. 10.4.1 A diagram representing the hierarchical relationships among data items shall be prepared. The procuring activity will provide the data for Mission and Scenarios/conditions, and the contractor shall provide all other required data items.				1. Mission	5. Duties	2. Scenarios/conditions	6. Tasks	3. Requirements	7. Subtasks	4. Jobs	8. Task elements
1. Mission	5. Duties										
2. Scenarios/conditions	6. Tasks										
3. Requirements	7. Subtasks										
4. Jobs	8. Task elements										

3. DESCRIPTION/PURPOSE (Cont'd)

This Data Item Description (DID) identifies the Government content and format requirements to prepare a report of task inventory data.

7. APPLICATION/INTERRELATIONSHIP (Cont'd)

7.3 The Task Inventory Report (TIR) will be used as the starting point for the Critical Task Analysis Report (CTAR), DI-H-XXXX, and the Task Analysis Report (TAR), DI-H-XXXX.

7.4 This DID applies to the requirements of DRAFT MIL-STD-XXXX pertaining to the preparation of a task inventory.

10. PREPARATION INSTRUCTIONS (Cont'd)

10.4.2 All tasks, subtasks, and task elements shall be textually represented as task statements. Task statements shall be composed of:

- a. an action verb that states what is to be accomplished in the task,
- b. an object that identifies what is to be acted upon in the task, and
- c. any qualifying phrases needed to distinguish the task from related or similar activities, limit and define the scope of the task, and clearly communicate the nature of the task.

10.4.3 Hierarchically related task inventory data shall be numbered accordingly.

10.5 Traceability. The Task Inventory Report shall include the names of individuals involved in the development and validation of the task inventory.

10.6 Access. In accordance with MIL-H-46855, all data and documentation shall be maintained at the contractor's facilities and made available to the procuring activity for meetings, audits, demonstrations, test and evaluation, and related functions. The completed task inventory database and report become the property of the Government at the end of the task analysis effort.

Manpower and Personnel Requirements for Development Contracts

3. Task Performance Requirements Analysis

A Task Performance Requirements Analysis (TPRA) shall be performed for each function allocation alternative developed for each design concept under consideration. Performance standards shall be established for each critical task identified in the SFA that involves personnel. Critical tasks, as specified in Para 6.2.1 of MIL-H-46855B, shall be identified during the TPRA and shall be separately listed and described. Critical tasks shall be subjected to a task analysis in accordance with MIL-STD-1478, Task Analysis. In addition, other tasks shall be analyzed as specified by the procuring activity. The performance standards for each critical task shall be:

- a. Stated in terms of minimum acceptable accuracy and maximum acceptable time.
- b. Derived from the system quantitative performance requirements.
- c. Directly related to the measures to be used in the evaluation of system effectiveness. These quantitative performance requirements shall subsequently be used in both system analysis and system testing.

The TPRA shall have a consolidated task inventory.

NOTE: DID DI-S-4057, Scientific and Technical Reports applies to reporting the critical task performance requirements developed in the TPRA. DID DI-H-(Task Analysis Report)* applies to reporting the task analysis of critical tasks and other tasks specified by the procuring activity. Deliverable data identified on the DD Form 1423 shall be prepared in accordance with these DIDs.

*from MIL-STD-1478

DATA ITEM DESCRIPTION		2 IDENTIFICATION NO(S)	
1 TITLE		AGENCY	NUMBER
Scientific and Technical Reports		DSA	DI-S-4057
3 DESCRIPTION/PURPOSE		4 APPROVAL DATE	
Technical reports are acquired to provide the scientific and technical community a description of the precise nature and results of research, development, test, and evaluation (RDT&E) accomplished. Technical reports may be definitive for the subject presented, exploratory in nature, or an evaluation of critical subsystem or of technical problems.		17 October 1973	
		5 OFFICE OF PRIMARY RESPONSIBILITY	
		DSAH-SC	
		6 DDC REQUIRED	
		X	
		7 APPROVAL LIMITATION	
8 APPLICATION INTERRELATIONSHIP		9 REFERENCES (Mandatory as cited in block (9))	
This Data Item is applicable to technical reports produced as a result of Department of Defense Research and Development contracts. The form of the Report to be delivered will be specified on the DD Form 1423 by the DoD component.		MIL-STD-847	
		10 MCSL NUMBER(S)	
11 PREPARATION INSTRUCTIONS			
The report form, format, and content shall be in accordance with MIL-STD-847.			
U S GOVERNMENT PRINTING OFFICE 1981 — 703-023/4053			

FROM REFERENCE #7

DATA ITEM DESCRIPTION		Form Approved OMB No. 0704-0188 Exp. Date Jun 30 1986	
1. TITLE TASK ANALYSIS REPORT		2. IDENTIFICATION NUMBER	
3. DESCRIPTION/PURPOSE 3.1 The analysis of human task involved in the operation or maintenance of the equipment under development provides one of the bases for making decisions in the areas of human engineering, training, logistics, tests and evaluation, manning, and workload. This Data Item Description (DID) identifies the (Continued on page 2)			
4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR) ?	6a. DTIC REQUIRED ?	6b. GIDEP REQUIRED ?
7. APPLICATION/INTERRELATIONSHIP 7.1 This Data Item Description (DID) contains the format and content preparation instructions for task analysis data generated under the work tasks described in DRAFT MIL-STD-XXXX, Task Analysis Standard. 7.2 This DID is applicable to the acquisition of military systems, equipment, and facilities. (Continued on page 2)			
8. APPROVAL LIMITATION	9a. APPLICABLE FORMS	9b. AMSC NUMBER	
10. PREPARATION INSTRUCTIONS 10.1 <u>Source document.</u> The applicable issue of the documents cited herein, including their approval dates and dates of any applicable amendments and revisions, shall be as reflected in the contract. 10.2 <u>Guidance.</u> The Task Analysis Report (TAR) shall be based on the Task Analysis Standard, DRAFT MIL-STD-XXXX. Methods appropriate to the development of the Task Analysis Report are described in DRAFT MIL-HDBK-XXXX. 10.3 <u>Content.</u> The Task Analysis Report shall contain the following information items, either numbered or arranged (e.g., by outline or diagram) to show their relationship to each other: A. Input Parameters Information Required Information Available Initiating Cues Data Display Format			

3. DESCRIPTION/PURPOSE (Cont'd)

Government content and format requirements to prepare a report of task analysis data.

7. APPLICATION/INTERRELATIONSHIP (Cont'd)

7.4 This report describes the results of a task analysis performed by the contractor, which provides a database to support efforts in the areas of human engineering, training, logistics, test and evaluation, manning, and workload.

10. PREPARATION INSTRUCTIONS (Cont'd)

B. Central Processing Parameters

Decision or Evaluation Processes
Decisions Reached After Evaluation
Job Knowledge Required
System Knowledge Required
Academic Knowledge Required
Significant Memorization Requirements

C. Response Parameters

Actions Taken
Body Movements Required by Action Taken
Workspace Envelope Required by Actions Taken
Workspace Envelope Available for Actions Taken
Physical Skills Required
Frequency or Interval of Actions
Tolerances of Actions
Tools, Job Aids Used
Support and Test Equipment
Power Requirements
Spares or Parts
Adequacy of Space Support
Controls Used
Control Location
Instrumentation, Displays, Signals Used
Instrumentation, Display, Signal Location

D. Feedback Parameters

Feedback Required
Feedback Available
Cues Indicating Task Completion
Rate of Feedback Update
Format of Feedback

10. PREPARATION INSTRUCTIONS (Cont'd)

E. Environmental Parameters

Workspace Available
Workspace Envelope Required
Workplace Arrangement
Environment Contamination Level
Climate
Noise
Shock, Vibration, Motion
Lighting
Workspace Accessibility
Workplace Accessibility
Life Support and Protective Gear

F. Safety Parameters

Types and Locations of Safety Hazards
Cause of Safety Hazard
Frequency of Safety Hazard
Consequences of Safety Hazard
Safety Procedures
Recommendation to Eliminate or Minimize Safety Hazard

G. Health Parameters

1. Mechanical Forces

Impulse Noise and Blast Overpressure
Steady State Noise
Ultrasound
Vibration and Motion
Acceleration and Deceleration
Impact, Shock and Recoil
Windblast
Pressure Fluctuations
Weight and Force Loadings

2. Temperature Extremes

Ambient and Radiant Heat
Surface Heat
Flame and Fire
Ambient Cold
Surface Cold

3. Electromagnetic Radiation

- Laser Radiation
- Microwave and RF Radiation
- Ultraviolet Radiation
- Intense Visible Light
- Ionizing Radiation
- Particle Beams
- Magnetic Fields

4. Toxic Substances

- Fumes, Vapors and Aerosols
- Smoke
- Liquids
- Solids
- Dust and Particulates
- Chemical Warfare Agents, Biological Warfare Agents, and Antidotes

5. Psychological Stress

- Confined Spaces
- Isolation
- Sensory and Cognitive Overload
- Visual Illusions and Disturbances
- Bodily Disorientation (Vestibular and Kinesthetic)
- Sustained High-Intensity Operations

6. Other

- Caustic Chemicals
- Oxygen Deficiencies (Airborne and Terrestrial)
- Restricted Nutrition
- Restricted Water Availability
- Excessive Water, Moisture or Humidity
- Human Waste Elimination Constraints
- Pests (Insects and Rodents)
- Broken Glass, Shrapnel and Missiles
- Skin or Eye Contact
- Electric Shock
- Bacteria, Viruses and Fungi

H. Performance Standards and Workload Parameters

- Accuracy Requirements
- Consequences of Errors
- Subjective Assessment by Operator, Maintainer, or Support Personnel of the Reasons for Their Errors

10. PREPARATION INSTRUCTIONS (Cont'd)

Description of Each Possible Human-initiated Error (s)
Performance Under Stress
Subjective Assessment of Task Workload
Subjective Assessment of Equipment Design Adequacy for Task Performance
Subjective Assessment of Sufficiency of Training and Experience for Task Performance
Physiological Assessment of Workload
Cognitive Workload Assessment
Criteria for Successful Performance
Error Sources
Allocated Elapsed Time or Time Budget
Allocated Man-hours
Predicted Elapsed Time
Predicted Man-hours
Task Schedule or Time Line
Elapsed Time Required to Accomplish the Task

I. Social and Organizational Parameters

Task Interdependence of Crewmembers
Number of Personnel Required to Perform Task
Specialty and Experience Requirements
Division of Labor or Responsibility
Communications Employed

J. Housekeeping Parameters

Task, Subtask, Task Element Title or Statement
Task, Subtask, Task Element Number
Methodology Used to Generate Task Analysis Results
Data Sources Used
Date
Name of Task Analyst
System Mission, Function
Position Title, Duty (of position being analyzed)
Position or Skill Specialty Code (MOS)
Activities Preceding the Task
Concurrent Tasks
Additional Comments
Validation and Quality Control (Especially of Critical Tasks)

K. Other Parameters (not listed above)

10.4 Format. The Task Analysis Report shall incorporate graphic formats, textual formats, or both. Each class of format is described below.

10.4.1 Graphic format. Graphics shall be used primarily to pictorially represent the sequential, parallel, or interactive relationships of human task and equipment components.

10.4.2 Textual format. Text shall be used to show a level of detail that cannot be encompassed in the graphics and to describe tasks or task parameters that are not easily represented by graphical means. Narrative formats shall be taken to include lists, outlines, and forms.

10.4.3 Graphic/Textual Format. Task Analysis data that are presented in both graphic and textual formats shall be alphanumerically coded to clearly indicate the redundancy or relationship between graphic and textual formats.

10.5 Traceability. The Task Analysis Report shall include the names of individuals involved in the development and validation of the task analysis data.

10.6 Access. All data and documentation shall be maintained at the contractor's facilities and made available to the procuring activity for meetings, audits, demonstrations, test and evaluation, and related functions. The completed task analysis database and report become the property of the Government at the end of the task analysis effort.

Manpower and Personnel Requirements for Development Contracts

4. Manpower, Personnel and Design Trade-off Analysis

Where performance problems have been identified in the TPRA, the contractor shall provide a Manpower, Personnel and Design Trade-off Analysis (MPDTA) to identify alternative design concepts that maximize task and system performance levels while remaining within manpower and personnel constraints established by the procuring activity. The analysis shall address options among manpower, personnel and equipment design considerations. Factors analyzed shall include, but not be limited to personnel aptitude levels, grade levels, numbers of military occupational specialties (MOS), numbers of personnel, task complexity, workload, and the characteristics of the personnel/materiel interface, person to person interfaces, and the work place environment. The results of the MPDTA shall be applied in equipment design decisions.

NOTE: DID DI-S-3606, System/Design Trade Study Reports, applies to these requirements. Deliverable data identified on the DD Form 1423 shall be prepared in accordance with the instructions specified in that DID.

DATA ITEM DESCRIPTION		2. IDENTIFICATION NO(S)	
		AGENCY	NUMBER
1. TITLE			
System/Design Trade Study Reports		USAF	DI-S-3606/ S-128-1
3. DESCRIPTION/PURPOSE		4. APPROVAL DATE	
<p>The Trade Study Report is used to document the decision rationale for designated trade studies. Trade studies may involve a variety of engineering techniques including complete or partial simulation of operations or maintenance. Trade Studies are accomplished at different levels, thus reporting data may vary considerably. As appropriate, Trade Study Reports will document the results of system effectiveness, life cycle cost, and risk analyses.</p>		1 November 1971	
		5. OFFICE OF PRIMARY RESPONSIBILITY	
		AFSC	
		6. DOC REQUIRED	
7. APPLICATION/INTERRELATIONSHIP		8. APPROVAL LIMITATION	
<p>Trade studies to support the on-going design definition activity are accomplished at various points in the acquisition cycle and are not limited to just one phase of a program. Specific trade studies and their attendant reports are usually specified by the procuring activity. Trade Studies and Trade Study Reports must be compatible with the contractual SEMP, DI-S-3618/S-152.</p>		9. REFERENCES (Mandatory as cited in block 10)	
		AFSCP 375-5 MIL-STD-499	
		10. PREPARATION INSTRUCTIONS	
<p>1. Trade Study Reports shall, as a minimum, contain the information set forth below. The content of the study report is encouraged to consist of extracts from the designer's notebook, contractors' internal memorandums, minutes of meetings, reductions of presentation charts, and formal engineering reports.</p> <p>a. <u>Identification and Listing of Functional and Technical Design Requirements for Trade-Off.</u> Identify and list the functional and technical design requirements which are subject to trade-off. The functional requirement is listed first, and then related technical design requirements are listed. For example, "Determine quantity of loaded propellant" would be a functional requirement and "The propellant loading measurement system must be capable of indicating the quantity of propellant loaded to each tank to an accuracy of $\pm .35\%$ by weight of propellant required" would be a design requirement. Immediately following, state each listed requirement, if available; e.g., "This reference shall consist of the title, file number, date, page number, and paragraph number from which the requirement statement was extracted."</p> <p>b. <u>Identification of Possible Design Approaches and Then Design Characteristics.</u> List possible design approaches and identify significant design characteristics of each design approach. This list would be generated concurrently with the above requirements. Only reasonably attainable design approaches shall be pursued considering technical capabilities, cost, time schedules, system effectiveness, and resource limitations or other constraints as specified in system requirement documentation. For each potential and alternative design approach listed, the</p>			

DD FORM 1664

PAGE 1 OF 2 PAGES

DI-S-3606/S-123-1 (Continued)
Preparation Instructions (Continued)

contractor shall identify significant characteristics applicable to each. These characteristics shall relate and be restricted to those attributes of the design approach which bear most directly on its feasibility in relation to the requirements set forth above. The significant characteristics shall reflect predicted impact on such factors as cost, maintainability, reliability, personnel and training requirements, technical orders, schedules, performance, survivability, safety, growth potential, facilities, security (clandestine vulnerability) transportability, procurability, and producibility.

c. Comparison of Matrix of Design Approaches. Prepare a matrix to compare the design characteristics for each design approach to determine the degree to which the design approaches satisfy the functional and technical design requirements. The objective is to facilitate rapid comparison and evaluation of potential design approaches and to allow preliminary screening-out of those design approaches that are inconsistent with the functional and technical design requirements. For submittal purposes, the contractor should attempt to combine the matrix information required with the information required in paragraph b. above. Where applicable, include cost effectiveness models and life cycle cost analysis data.

d. Selection of Design Approach. Select the most promising design approach and provide reasons to substantiate the selection. The reasons given for the selection shall be in the form of schematic diagrams, outline drawings, interface details, functional diagrams, reliability data, statistical interference data, and narrative and any other backup data deemed necessary to support the selection. The reasons shall cover the requirements the selected approach imposes on other areas of the system. The requirements imposed on facilities, training, training equipment, human performance, and procedural data shall be determined and entered on the PAS (see Data Item Description DI-S-3605/S-127-1).

e. Trade Study Report Index. The contractor shall prepare and maintain a current Trade Study Report index identifying all the trade studies required, the studies completed, and those to be completed.

Manpower and Personnel Requirements for Development Contracts

5. Task Performance Capability Analysis

Task Performance Capability Analysis (TPCA) shall be performed for each design concept that is still under consideration for the system. The analysis shall provide estimates of the distribution of task performance that can be expected from the personnel required for each design concept. The analyses shall be conducted:

- a. Within the manpower and personnel constraints established by the procuring activity and
- b. To show the impact on system effectiveness of changes in numbers of personnel, personnel aptitude levels and quality mix without regard to preestablished manpower and personnel constraints.

From the analysis, the expected distribution of system performance shall be derived for each design concept still under consideration. The analysis shall provide a means for relating the quantitative system performance requirements to the estimates of soldier performance for each task such that variations in the quality (time and accuracy) of that performance will affect the numerical value of the metric used to express system effectiveness. The analysis shall be based on the task inventory developed in the SFA, the MPDTA, if conducted, and the task performance estimates derived in the TPCA.

These results shall be compared with the system performance requirements and the results of those comparisons shall serve as input in the evaluations leading to selection of the design concept for further development.

These analyses shall identify requirements, if any, for tasks, skills, and knowledges that are not currently required of soldiers in the MOS(s) designated for the system. These new requirements shall be described in the TPCA report. Any reductions in manpower and personnel requirements compared to maximums allowed by the preestablished constraints also shall be described.

If these analyses reveal that system effectiveness and performance objectives stated in the Required Operational Capability (ROC) cannot be achieved within preestablished manpower and personnel constraints, or that system effectiveness and performance can be significantly increased if preestablished manpower and personnel constraints are exceeded, then the quantitative and qualitative excesses shall be described. The impact on system performance and availability of not providing those excesses shall be described in quantitative terms.

NOTE: DID DI-H(Task Performance Capability Analysis Report) applies to these requirements. Deliverable data identified on the DD Form 1423 shall be prepared in accordance with instructions specified in that DID.

DATA ITEM DESCRIPTION			Form Approved OAS No. 0704-0188	
2. TITLE		1. IDENTIFICATION NUMBER		
Task Performance Capability Analysis Report				
3. DESCRIPTION/PURPOSE				
3.1 This report provides the results of the Task Performance Capability Analyses (TPCA) that compared equipment design changes with the distribution of personnel task performance for various manpower levels.				
4. APPROVAL DATE (YYMMDD)		5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)		6a. DTIC APPLICABLE
		A DAPE-MR		6b. GIDEP APPLICABLE
7. APPLICATION/INTERRELATIONSHIP				
7.1 This DID is applicable to all acquisition programs.				
7.2 It is not intended that all the requirements contained herein should be applied to every program or program phase. Portions of this DID are subject to deletion tailoring depending upon the program phase in which it is applied in the solicitation contract.				
7.3 This DID contains the format and content preparation instructions to satisfy the requirements of x.x.x of MIL-STD-xxxx.				
(Continued on Page 2)				
8. APPROVAL LIMITATION		9a. APPLICABLE FORMS		9b. AMSC NUMBER
10. PREPARATION INSTRUCTIONS				
10.1 <u>Reference Documents.</u> The applicable issue of the documents cited herein, including their approval dates and dates of any applicable amendments, notices, and revisions, shall be as specified in the contract.				
10.2 <u>Report Format.</u> The Task Performance Capability Analysis Report shall be in the contractor's format.				
10.3 <u>Report Content.</u>				
10.3.1 <u>Task Performance Distribution.</u> Estimates of the distribution of personnel task performance shall be provided for each equipment design. For each potential and alternative design approach listed, identify significant manpower and personnel characteristics applicable to each. The personnel task performance capability allocation for each equipment design will be compared against the system's manpower and personnel constraints as provided by the procuring activity. Show the impact in manpower quantities and personnel quality by aptitude area scores for each equipment design using unconstrained manpower or personnel resources.				
10.3.2 <u>System Performance Comparisons.</u> A comparison table to depict the identified knowledges and skills required to operate and maintain each design approach shall be made to portray design task performance differences.				
(Continued on Page 2)				
11. DISTRIBUTION STATEMENT				
Approved for public release; distribution is unlimited				

7. APPLICATION/INTERRELATIONSHIP (Continued)

7.4 The Task Performance Capability Analysis Report is related to DI-H-7054, Human Engineering System Analysis Report; DI-H (HEL Task Inventory Report #TBP); DI-S-4057, Scientific and Technical Reports; DI-H (HEL Task Analysis Report #TBP); DI-H-7055, Critical Task Analysis Report and DI-S-3606, System/Design Trade Study Reports.

10. PREPARATION INSTRUCTIONS (Continued)

The table will allow rapid comparison and evaluation of potential design approaches. Each design approach will have listed any risks or assumptions which may impact the manpower and personnel task performance capabilities not yet confirmed.

10.3.3 Preferred Constrained Design Concept. Select the preferred design based on the most equitable and efficient distribution of task performance. Provide the results in both tabular and narrative form. Justify the selection by presenting the manpower and personnel constraints, system performance requirements, knowledge and skill prerequisites and any other backup data deemed necessary to support the selection.

10.3.4 Preferred Unconstrained Design Concept. When a preferred design alternative exceeds preestablished manpower or personnel constraints, identify all advantages of the design selection that outweigh the constraint restrictions. Show whether performance objectives can actually be met or not within the manpower and personnel constraints. Describe how system effectiveness and performance can be increased by exceeding the manpower or personnel constraints. Determine the quantitative manpower increases for each system and all systems. Describe tasks, skills, knowledges and physical strengths that are not currently required of operators and maintainers in the MOS(s) designated for the system. The content, level of detail and format of these descriptions shall be suitable for inclusion in the 611 series of Army regulations on personnel classification.

Manpower and Personnel Requirements for Development Contracts

6. Manpower and Personnel Configuration Analysis

A Manpower and Personnel Configuration Analysis (MPCA) shall be conducted on the selected design concept. The analysis shall be based upon results of the TPRA, MPDTA and TPCA. The analysis shall consider variations in personnel aptitude level, quality mix, physical profiles, physical strength requirements and any special personnel qualifications identified in previous analyses. The analysis shall also consider numbers of MOS's, grade levels and total manpower, including military (Officer, warrant officer, and enlisted, both active and reserve component), civilian and contract personnel, necessary to meet system requirements.

Based on this analysis, a manpower and personnel configuration shall be recommended for operation, maintenance and support of the equipment. The recommended configuration shall allow achievement of system performance and availability objectives. The recommended configuration shall be described in terms of the numbers of personnel by MOS and grade level. The description shall include additional skill indicators (ASI), personnel aptitude information, physical profiles, physical strength requirements and any special personnel requirements essential to system availability and performance. Comparable information shall be included in the personnel configuration description for civilian and contract personnel who are essential to achievement of the total system availability and performance objectives. The recommended manpower and personnel configuration shall be described in the Manpower and Personnel Configuration Report.

7. Organizational Structure Trade-off Analysis

An Organizational Structure Trade-off Analysis (OSTA) shall be conducted. The OSTA shall develop and analyze alternative organizational structures for military units projected for operational use of the equipment under development. The analysis shall include consideration of integrated operations with other systems and interfaces with other systems and other equipments. The analysis shall include supervisory and leadership positions as well as manpower and personnel requirements for institutional and unit training. The impact of system deployment on the manpower and personnel requirements and organizational structure of maintenance and other support units shall be considered in the analysis. The analysis shall result in a recommended unit structure with the minimum manpower and personnel resources required to allow achievement of system availability and performance objectives. A description of the recommended unit structure shall be included in the Manpower and Personnel Configuration Report.

Manpower and Personnel Requirements for Development Contracts

8. Manpower and Personnel Configuration Report

A Manpower and Personnel Configuration Report (MPCR) shall be prepared. The MPCR shall include, but not be limited to:

- a. A description of the recommended manpower and personnel configuration resulting from the MPCA. The description shall cover: qualitative and quantitative manpower and personnel requirements, job or position summary descriptions, new skills, and new knowledge; including prerequisites for job specific training. Manpower and personnel requirements which exceed the constraints established by the procuring activity shall be described. The description shall encompass all operational, maintenance, and support functions required to attain system availability and performance objectives and shall cover military, civilian, and contract personnel.
- b. A description of the recommended military unit structure resulting from the OSTA. The impact of system deployment on the manpower and personnel requirements and organizational structure of maintenance and other support units shall be included in the description.

NOTE: DIO DI-H-(Qualitative and Quantitative Personnel Requirements Information (QQPRI) and Training Requirements Report), applies to these requirements. Deliverable data identified on the DD Form 1423 shall be prepared in accordance with instructions specified in these DIOs.

DATA ITEM DESCRIPTION			Form Approved OMB No 0704-0188	
2. TITLE Qualitative and Quantitative Personnel Requirements Information (QQPRI) and Training Requirements Report		1. IDENTIFICATION NUMBER		
3. DESCRIPTION/PURPOSE 3.1 QQPRI is used as a source of data for the development or revision of personnel concepts or policies, the identification of operator, maintainer and support personnel requirements by numbers, skills and other qualifications and planning the conduct of necessary training programs in operations and maintenance.				
4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR) A	6a. DTIC APPLICABLE	6b. GIDEP APPLICABLE	
7. APPLICATION/INTERRELATIONSHIP 7.1 This DID is applicable to all acquisition programs. 7.2 It is not intended that all the requirements contained herein should be applied to every program or program phase. Portions of this DID are subject to deletion tailoring depending upon the program phase in which it is applied in the solicitation contract. 7.3 This DID contains the format and content preparation instructions to satisfy the requirements of x.x.x of MIL-STD-xxxx. (Continued on Page 2)				
8. APPROVAL LIMITATION		9a. APPLICABLE FORMS		9b. AMSC NUMBER
10. PREPARATION INSTRUCTIONS 10.1 <u>Reference Documents</u> . The applicable issue of documents cited herein, including their approval dates and dates of any applicable amendments, notices, and revisions, shall be as specified in the contract. 10.2 <u>Report Format</u> . The QQPRI and Training Requirements Report shall be in the contractor's format. 10.3 <u>Report Content</u> . 10.3.1 <u>System Description</u> . The information and description of the system that are pertinent to the QQPRI shall be extracted, to the extent possible, from the system analyses or system specifications and include the following items. a. military purpose and operational characteristics b. maintenance and operational concepts, plans, and assumptions c. new equipment (Continued on Page 2)				
11. DISTRIBUTION STATEMENT Approved for public release; distribution is unlimited				

7. APPLICATION/INTERRELATIONSHIP (Continued)

7.4 The QQPRI is related to DI-H-1302, New Equipment Training Plan; DI-H-1317, Operator/Maintainer Taskload Analysis and DI-S-1818, Maintenance Engineering Analysis.

7.5 This DID supersedes DI-H-1300 and DI-H-3253/Q-103-2.

10. PREPARATION INSTRUCTIONS (Continued)

10.3.2 Maintenance and Operations Summary. This section shall include time based mission segments, function flow diagrams, line drawings, photographs, or other pictorial representations to illustrate job operations, locations, position interactions, and sequential work flow within and between organizational, operations, and support activities. Such illustrations shall be used to support narrative descriptions, which shall include numbered paragraphs listed as below.

- a. Summary of job operations
- b. Identification of personnel
- c. Team performance
- d. Time

10.3.3 Position Description. The basic data for position descriptions include duties and tasks selectively combined from the many actions demanded for the operation, maintenance, and control of the system. The position descriptions will include the following:

- a. A listing of duty positions required to operate, maintain and support the equipment.
- b. Descriptions of these positions and suggested placement and job title within the procuring activities military career fields, specialities, ratings or skill areas. Revised or new career fields will be reported, described and thoroughly justified.

10.3.4 Manning Data.

- a. Numerical requirements in both chart and narrative form showing estimates of manpower required to operate and to perform maintenance tasks at all level of maintenance and the differences in requirements compared to any preestablished manpower or personnel constraints. Manpower estimates will consider all predictable factors affecting personnel performance to include environment, task proficiency level, relationship of positions as teams, crews or independent and manning factors of 8 hours, 12 hours, 24 hours for periodic, continuous and strenuous position demands. The positions will be described by organizational, and functional diagrams showing the exact location of all positions.
- b. The grade and skill levels of all military (Active and Reserve component) and comparable civilian and contract personnel required to operate, maintain and support the system.

10. PREPARATION INSTRUCTIONS (Continued)

- c. Special skills, knowledges, abilities, physical or mental qualifications required to perform operator or maintenance tasks. Primary effort should be directed toward identification of new and unique skills.
- d. Information will be derived from task analysis and from Maintenance Engineering Analysis (MEA) and its supporting data items when it is applied to the contract. Otherwise, this report will be developed from system engineering or other available data.

10.3.5 Special Problem Areas. Any unusual personnel requirement problems inherent in the proposed maintenance and operational employment of the system that have not been previously described in this report or that require further attention. The following will apply:

- a. Special emphasis will be placed on hazards associated with system operation and maintenance.
- b. The nature of the problems encountered will be described and possible alternative solutions will be suggested.
- c. The nature of the solutions will be oriented toward the aptitude of individuals required or to the special training needed to enable personnel to cope with these problems.
- d. If solutions cannot be made through selection or training procedures, the contractor will suggest equipment or control modifications that could alleviate the problems.

10.3.6 New Equipment Training (NET) Requirements Report.

- a. Military, civilian or contract personnel instructor requirements for institutional and unit training shall be described in narrative and chart form.
- b. Operator and maintenance training requirements will be reported by the contractor in narrative format and will contain details for conduct of the following:
 - (1) Staff Planner Courses
 - (2) Technical training courses for key instructor, key depot and other key personnel as required
 - (3) New Materiel Introduction (NMI)
 - (4) New Equipment Training Teams (NETT)
- c. Details shall include as appropriate:
 - (1) Course title
 - (2) Course length

10. PREPARATION INSTRUCTIONS (Continued)

- (3) Functional area (Maintenance or Operations)
- (4) Entrance requirements
- (5) Course output stated in terms of an existing career field or appropriate position definition
- (6) Subject outline of proposed program of instruction
- (7) Class size (number of students per class session and practical exercise session)
- (8) Equipment required
- (9) Training devices and aids
- (10) Training equipment
- (11) Facilities/services

Manpower and Personnel Requirements for Development Contracts

9. Soldier Performance Measurement and Advanced Soldier Performance Measurement

Soldier Performance Measurement (SPM) shall be conducted in order to establish the degree to which required task performance is attainable and sustainable. SPM shall be designed to capture data on all tasks designated as "critical" (see paragraph 6.2.1 of MIL-H-46855) for operations, maintenance and support functions. The SPM shall require no fewer than three individuals (i.e., N=3 or more) performing (in turn) each task identified as critical. The three or more individuals selected will each either be active duty U.S. Army soldiers of the grade and MOS tentatively identified for the job to which each critical task will be assigned or, if actual soldiers are not provided to the contractor for SPM, be persons of similar age, physical characteristics and ASVAB scores. SPM shall provide a means for relating the quantitative system performance requirements to the measured soldier performance for each critical task such that variations in the quality (timeliness) and accuracy) of that performance will affect the numerical value of the metric used to express system effectiveness. The SPM effort shall provide for the collection of soldier performance data by measuring the time and accuracy of that performance for each critical task. The measures shall be taken after personnel have been trained and following sufficient practice at the task to attain individual peak performance.

Performance measures shall be taken under a range of environmental conditions approximating those projected for the fielded system under both daylight and night operations. The environmental conditions (temperature, humidity, illumination, noise, ventilation, vibration, etc.) under which the data were gathered shall be disclosed, and a description (referenced to any existing engineering drawings) of the soldier-machine interface (SMI) shall be included. Suitable military garments and equipment appropriate to the tasks and projected environmental conditions shall be worn during soldier performance measurement.

The soldier performance data shall be analyzed by both time and errors. Both the frequency and cause(s) of errors shall be reported and shall be supplemented (if appropriate) by explanations from participants of the reasons for their performance errors. Effects of measured soldier performance on the metrics for system effectiveness shall be shown, and any projected decrements in system performance shall be explained. Soldier performance data shall be analyzed to determine if any of the critical tasks for operations, maintenance, or support is aptitude-sensitive. Soldier performance data shall be presented (1) by each ASVAB subtest score of each soldier participant and (2) by the cluster of ASVAB subtest scores used to make MOS assignments applicable to the system being developed.

Advanced Soldier Performance Measurement (ASPM) shall be performed to account for any changes to the equipment design as the development process progresses. ASPM shall be conducted using actual equipment to verify or modify information from SPM obtained using mock-ups, simulations or preliminary designs. ASPM shall occur as early as possible in the development process and not later than Full Scale Development.

NOTE: DID DI-H-7058, Human Engineering Test Report, applies to reporting the SPM and the ASPM results. Deliverable data identified on the DD Form 1423 shall be prepared in accordance with instructions specified in that DID.

DATA ITEM DESCRIPTION	2. IDENTIFICATION NO(S).	
	AGENCY	NUMBER
1. TITLE Human Engineering Test Report	DOD	DI-H-7058
3. DESCRIPTION/PURPOSE This report provides evidence that the personnel-equipment/software interface requirements for the operation, maintenance and support of the system have been met. This report serves as the principal means of assessing the compatibility of the human performance requirements, personnel selection criteria, training program and design of the personnel-equipment/software interfaces.	4. APPROVAL DATE 1 June 1979	
	5. OFFICE OF PRIMARY RESPONSIBILITY ARMY/MIRADCOM	
	6. DDC REQUIRED	
	8. APPROVAL LIMITATION	
7. APPLICATION/INTERRELATIONSHIP This DID is related to DI-H-7051, Human Engineering Program Plan, DI-H-7053, Human Engineering Test Plan, and DI-H-7055, Critical Task Analysis Report. This DID replaces DI-H-1334A and DI-H-2111. This DID is primarily applicable to work tasks delineated in paragraph(s) 3.2.2.4 and 3.2.3 of MIL-H-46855B.	9. REFERENCES (MANDATORY AS CITED IN BLOCK 10) MIL-H-46855B MIL-STD-1472	
	MCSL NUMBER(S)	
10. PREPARATION INSTRUCTIONS 10.1 <u>General</u> . A Human Engineering Test Report (HETR) shall be prepared by the contractor for each personnel position in the system being developed. All of the operations and maintenance tasks required of the individual assigned to a personnel position are referred to as the "task group" of that position. 10.2 <u>Content Requirements</u> . 1) <u>Introductory Information</u> <ul style="list-style-type: none"> a) Specific title of test b) Identification of equipment or concept being tested c) Specific purpose of this test d) Objectives of this test (if appropriate, stated in terms of hypotheses to be tested) e) Date(s), location(s), and name(s) of individual(s) present and supervising the conduct of the test. 		

BLOCK 3, DESCRIPTION/PURPOSE (Continued)

This report will be used to determine whether and to what level or standard(s) each trained individual can perform in the specified sequence all assigned systems tasks; to determine whether and to what extent each individual's performance is affected by equipment configuration, the performance of other system personnel, or both; and to assess the impact of the measured human performance on the attainment of task, task group, and mission requirements.

BLOCK 10, PREPARATION INSTRUCTIONS (Continued)

f) for each task group or portion thereof reported, a list of all the discrete tasks and a brief description of the operational environment in which they are to be performed when the system is deployed.

2) Description of Test Methods and Controls

a) Statement of (or reference to) any human performance standards (e.g., "0.9 probability of operator launching missile within 10 seconds after detecting target") or assumed contribution to error (e.g., "aiming error less than 3 mils") contained in system development documents. If none, so state.

b) Description of environment at each distinct location of human performance. (Include noise and illumination levels, shock and vibration, air temperature and humidity, and ventilation. Also, state the concentration of and test participant exposure time to any toxic or hazardous substances; and state whether that exposure was or was not within the applicable safety limits for each substance.)

c) Description of test participants. For each participant, where relevant, state age, weight, body dimensions applicable to performance tasks (see paragraphs 3.1 and 5.6, MIL-STD-1472), visual acuity and hearing levels, any known physical disabilities, and educational and work experience.

d) Description of individual clothing and equipment (including all clothing and equipment worn, carried or otherwise borne on the body, such as weapon, communications equipment, headgear and protective mask).

e) Type and amount (in hours) of system-specific pre-test training (differentiating "hands on" practice from other training) given to test participants; and type, content and results of training assessment used. Also, state time intervals between end of training, training assessment and start of tests being reported.

10. PREPARATION INSTRUCTIONS (continued)

f) Description of mockup or equipment on which test is conducted (including material used and type of fabrication; dimensions; and cross-reference to blueprints, drawings or sketches).

g) Identification of deviation(s) during the test from conditions of expected use (subparagraph 1b(1)(f) above); narrative explanation of reason(s) for deviation(s), and presumed effect(s) of such deviation(s) on the validity of generalizations from test data.

3) Data Collection Techniques

a) Identification of the quantitative and qualitative measures of both human and system performance.

b) Description of methods, procedures, and instrumentation used in data collection.

c) Description of techniques used for data reduction, statistical techniques employed, and confidence levels selected.

4) Results

a) Summaries of quantitative human and system performance data.

b) Summaries of qualitative data (including questionnaires, interviews, checklists, etc.).

5) Description of Human Performance Errors

a) Narrative description, with photograph(s) if appropriate, of each error. Include frequency of occurrence of each error during test.

b) Consequence (brief statement of the immediate effect of the error on system operation).

c) Causes (isolation of the immediate cause of each actual performance error and identification of the events, conditions, operator workload, environmental factors, and equipment configurations which may have contributed to it).

d) Explanation by participants making errors of the reasons for the errors.

e) Recommended solutions (stated in terms of equipment redesign, alteration of tasks, personnel selection and/or training). Provide rationale.

10. PREPARATION INSTRUCTIONS (continued)

6) Description of Incompatibilities Among Human Performance and Equipment.

a) Identification

1. During the test what tasks of one task group interfered with the performance of which tasks of another task group? If none, so state.

2. During the test what human performance was adversely affected by what equipment configurations or characteristics? (Identify controls and/or displays needed but not present). If none, so state.

b) Recommended solutions (stated in terms of equipment redesign, alteration of tasks, personnel selection and/or training). Provide rationale.

7) Description of Observed Safety Hazards.

a) Narrative description, with photograph(s) if appropriate, of each safety hazard identified during the test. If none, so state.

b) Frequency each hazard was encountered by test participants.

c) Severity and consequence of each hazard.

d) Recommended action to eliminate or minimize hazard (stated in terms of equipment redesign, alteration of tasks, personnel selection and/or training). Provide rationale.

8) Analysis of Impact of Human Performance on Attainment of System Performance Goals.

a) Statement of (or reference to) system performance goals.

b) Narrative explanation of reasons why any human performance tasks required by present equipment design are not feasible; or why any standards presently set for specific human performance tasks are unattainable. (If all human performance requirements are feasible and any standards set appear to have been met, so state).

c) Narrative explanation of how measured human performance times and errors in operations and maintenance can affect system reliability and availability.

d) Narrative explanation of how measured human performance times and error frequencies and magnitudes can affect system effectiveness.

10. PREPARATION INSTRUCTIONS (continued)

e) Narrative explanation of how system performance goals would be affected by implementing the solutions recommended in subparagraphs (5), (6) and (7) above.

9) Conclusions

a) Summary of major findings from test.

b) Implications of major findings (including anticipated effects on system reliability, availability and effectiveness).

10) List of recommended changes to equipment configuration, human performance tasks, personnel selection and/or training (in order of decreasing importance) with indication of government or contractor organizations responsible for implementing recommended actions.

Manpower and Personnel Requirements for Development Contracts

10. Manpower and Personnel Test and Evaluation and Advanced Manpower and Personnel Test and Evaluation

Building upon the individual task measures obtained during Soldier Performance Measurement (SPM), Manpower and Personnel Test and Evaluation (MPTE) shall be conducted. MPTE deals with an individual, a crew or a team, as appropriate, performing the set of duties and tasks that constitute the jobs within the system context. The purpose of MPTE is to demonstrate the feasibility of attaining the personnel performance needed to meet system performance requirements. MPTE shall be incorporated into the equipment test and evaluation program and shall be integrated into engineering design and development tests, contractor demonstrations, flight tests, acceptance tests, and other contractor conducted tests.

An MPTE plan shall be prepared. The plan shall describe how tests and evaluations will be conducted to measure the manpower and personnel contribution to system performance. The plan shall provide for variations in manpower and personnel parameters sufficient to assess the accuracy of the estimates made in the Task Performance Capability Analysis (#5). The MPTE shall assess the degree to which system performance can be achieved within the preestablished personnel constraints. The MPTE test plan shall describe the equipment, mock-ups and simulations to be used, the test conditions, and personnel to be tested. The plan shall describe the nature of the data to be collected and the means of collection, recording, and analysis. Checklists, manuals and other job aids to be used shall also be described. The MPTE plan may be prepared as a separate entity or integrated into the Human Engineering Test Plan, if the latter is a contract requirement.

MPTE shall begin as early in the development process as possible and the results shall be used as inputs to subsequent design decisions. MPTE may be integrated with, or conducted concurrently with, Human Engineering Test and Evaluation (3.2.3, MIL-H-46855B) if the latter is also a contract requirement.

Advanced Manpower and Personnel Test and Evaluation (AMPTE) shall be performed to account for any changes to the design. AMPTE shall be conducted using actual equipment to confirm or modify information initially gained in MPTE. AMPTE shall be conducted during Full Scale Development or earlier if feasible.

NOTE: DID-H-7053, Human Engineering Test Plan applies to this requirement. DI-H-7058, Human Engineering Test Report applies to the reporting of the results of MPTE and AMPTE. Deliverable data identified on the DD Form 1423 shall be prepared in accordance with instructions specified in these DIDs.

DATA ITEM DESCRIPTION		2. IDENTIFICATION NO(S).	
		AGENCY	NUMBER
1. TITLE Human Engineering Test Plan		DOD	DI-H-7053
3. DESCRIPTION/PURPOSE This plan details the proposed testing to demonstrate that the personnel-equipment/software combination can accomplish the intended operation and maintenance functions in accordance with system specifications. This plan serves as the principal means of planning for validating human performance requirements, accuracy of personnel selection criteria, adequacy of training, and acceptability of design of the personnel-equipment/software interface.		4. APPROVAL DATE 1 June 1979	
		5. OFFICE OF PRIMARY RESPONSIBILITY ARMY/MIRADCOM	
		6. DDC REQUIRED	
		8. APPROVAL LIMITATION	
7. APPLICATION/INTERRELATIONSHIP This DID is related to DI-H-7051, Human Engineering Program Plan, DI-H-7055, Critical Task Analysis Report and DI-H-7058, Human Engineering Test Report. This DID replaces DI-H-1313 and DI-H-2105. This DID is primarily applicable to work tasks delineated in paragraph(s) 3.2.3 of MIL-H-46855B.		9. REFERENCES (MANDATORY AS CITED IN BLOCK 10) MIL-H-46855B MIL-STD-1472	
		ACSL NUMBER(S)	
10. PREPARATION INSTRUCTIONS 10.1 <u>General</u> . The Human Engineering Test Plan (HETP) shall document in detail the contractor's plan for gathering and analyzing data to show that the system, when fielded, will satisfy four criteria: 1) All human performance requirements for operations and maintenance can be performed to an acceptable level or standard under conditions of expected use; 2) the human performance requirements for operations and maintenance can be performed reliably by personnel reasonably representative of the military personnel who will ultimately perform them; 3) both the cost (in terms of all resources required) and some measure (based on human performance time and error data) of prospective effectiveness of the contractor's training program for operations and maintenance are known; and 4) the design of system hardware and software facilitates efficient, safe and accurate human performance. 10.2 <u>Content Requirements</u> . 1) Introductory information			

DD FORM 1664
JAN 68

PAGE 1 OF 4 PAGES

10. PREPARATION INSTRUCTIONS (continued)

- a) Title descriptive of each test to be conducted.
- b) Identification of equipment (or concept) being tested.
- c) Statement of the task groups (or portions thereof) being reported. (A list, in sequential order, of all of the discrete performance tasks--with critical tasks identified--which will be required of each person in the system.)
- d) Purpose of tests.
- e) Objective(s) of tests (if different from subparagraph d) above).

2) Test Design. Identification of test conditions, performance measures, sample sizes, and sequence of test events.

3) Test Methods and Controls. Description of procedures to be followed in conducting each test. Explanation of how environmental variables and other factors which could affect the performance measures will be controlled or described, including where relevant:

- a) noise
- b) illumination level
- c) shock and vibration
- d) air temperature and humidity
- e) ventilation
- f) exposure to toxic or hazardous substances.

4) Test Participants. General description of the personnel population from which test participants will be selected. Identification and justification of test participant selection criteria. Identification of methods by which data describing actual test participants will be gathered, including, where relevant:

- a) age
- b) weight
- c) sex
- d) body dimensions relevant to performance tasks (paragraphs 3.1 and 5.6 of MIL-STD-1472)
- e) visual acuity

10. PREPARATION INSTRUCTIONS (continued)

- f) hearing level
- g) existence of physical disabilities
- h) educational and work experience
- i) prior experience relevant to performance tasks

5) Training of Test Participants.

- a) Description of type and amount (in hours) of system-specific pre-test training planned for test participants.
- b) Description of any end-of-training comprehension test administered to test participants before test data-gathering begins.

6) Equipment Involved.

- a) Description of mockup or equipment on which tests will be conducted (including material to be used and type of fabrication; dimensions; and cross-reference to blueprints, drawings or sketches).
- b) Identification of other, non-system equipment involved in tests (including all equipment to be worn, carried or otherwise borne on the body of test participants such as weapon, communications equipment, headgear, survival equipment, protective mask and night vision equipment).

7) Data collection. Detailed description of the instrumentation or other means which will be used to obtain raw data on each of the performance measures. Identification of forms, if any, which will be used for recording data. Description of the frequency and means by which data on environmental variables and other extraneous factors will be collected.

8) Data Reduction. Detailed descriptions of techniques to be used for transformation and combination of raw data; statistical techniques to be employed and assumptions pertaining to the use of each (e.g., normally distributed); and confidence levels selected.

9) Data Analysis. Explanation of how the data collected will be used in:

- a) human performance error analysis (e.g., "calculating operator error rate for mission-critical tasks")
- b) identifying incompatibilities among human performance and equipment

DI-H-7053

10. PREPARATION INSTRUCTIONS (continued)

- c) system safety analysis
- d) logistics and maintainability assessment(s).
- e) calculating system reliability, availability and effectiveness.

10) Test Reporting. Identification of tests for which a Human Engineering Test Report (DI-H-7058) will be prepared and tentative date(s) of initial submission.

10.3 Completeness.

This plan, if submitted incrementally to facilitate use of previous test results in planning additional tests which may be necessary, shall not be considered complete until all task groups and mission segments and their interactions have been accounted for.

U.S. GOVERNMENT PRINTING OFFICE: 1979-803-023/9040

Manpower and Personnel Requirements for Development Contracts

11. Manpower and Personnel Configuration Test

Manpower and Personnel Configuration Test (MPCT) shall be conducted. The objective of this test is to verify that the system's operational and performance requirements are attainable with the selected manpower and personnel configuration. The MPCT is a test of the organizational structure, manning level and personnel assignments by MOS and grade. Because it is comprehensive and large in scale, some level of government involvement is essential. That level shall be specified in the contract. The total test may be achieved through a series of related partial tests or subtests conducted at different times or at different locations. The test shall be conducted during the Full Scale Development phase or the Development/Proveout phase, as appropriate, using actual equipment as much as possible.

A Manpower and Personnel Configuration Test Plan shall be prepared. The plan shall describe how the objective of the MPCT will be met. The partial tests or subtests shall be described in detail. Their interrelationships and the contribution of each to the overall test objective shall be clearly explained. Test conditions, test equipment and test participants shall be described. The plan shall describe the data to be collected, the methods of collection and the data analyses to be performed.

NOTE: DID DI-H-7053, Human Engineering Test Plan applies to the MPCT test plan and DI-H-7058, Human Engineering Test Report applies in reporting MPCT results. Deliverable data identified on the DD Form 1423 shall be prepared in accordance with these DIDs.

APPENDIX D

RECOMMENDED IMPLEMENTATION
OF SECOND CHOICE

(Details for adding
manpower and personnel
requirements to MIL-H-46855B)

MANPRINT - MANPOWER AND PERSONNEL STANDARDIZATION

RECOMMENDED IMPLEMENTATION OF SECOND CHOICE

MANPOWER & PERSONNEL REQUIREMENT	ADD TO			APPLICABLE DIDS
	DOC.	PAGE	PARA.	
1. Manpower & Personnel (MAPP) Plan	MIL-H-46855B	3	Add as 3.1.3 and renumber	DI-H-7051, Human Engineering Plan (Modified) [Manufacturers MANPRINT Management Plan] Draft proposed DI-H-Manpower & Personnel Program (MAPP) Plan
2. System Function Analysis (SFA)	MIL-H-46855B	3	Current 3.2.1.1	DI-H-7054, Human Engineering System Analysis Report HEL draft proposed DI-H-Task Inventory Report
3. Task Performance Requirements Analysis (TPRA)	MIL-H-46855B	4	Add as 3.2.1.1.4	DI-S-4057, Scientific and Technical Reports HEL draft proposed DI-H-Task Analysis Report

MANPRINT - MANPOWER AND PERSONNEL STANDARDIZATION

RECOMMENDED IMPLEMENTATION OF SECOND CHOICE (continued)

MANPOWER & PERSONNEL REQUIREMENT	ADD TO			APPLICABLE DIDS
	DOC.	PAGE	PARA.	
Manpower, Personnel, & Design Trade-Off Analysis (MPDTA) 4.	MIL-H-46855B	5	Add as 3.2.1.4 and renumber	DI-S-3606, System/Design Trade Study Reports
Task Performance Capability Analysis (TPCA) 5.	MIL-H-46855B	5	Add as 3.2.1.3.3 and renumber	Draft proposed DI-H-Task Performance Capability Analysis Report
Manpower & Personnel Configuration Analysis (MPCA) 6.	MIL-H-46855B	6	Add as 3.2.2.1.3	Feeds the Manpower and Personnel Configuration Report
Organizational Structure Trade-Off Analysis (OSTA) 7.	MIL-H-46855B	6	Add as 3.2.2.1.4	Feeds the Manpower and Personnel Configuration Report
Manpower & Personnel Configuration Report (MPCR) 8.	MIL-H-46855B	6	Add as 3.2.1.1.5	DI-H-Qualitative and Quantitative Personnel Requirements Information (QQPRI), and Training Requirements Report (A combination and revision of 2 existing DIDs)

MANPRINT - MANPOWER AND PERSONNEL STANDARDIZATION

RECOMMENDED IMPLEMENTATION OF SECOND CHOICE (continued)

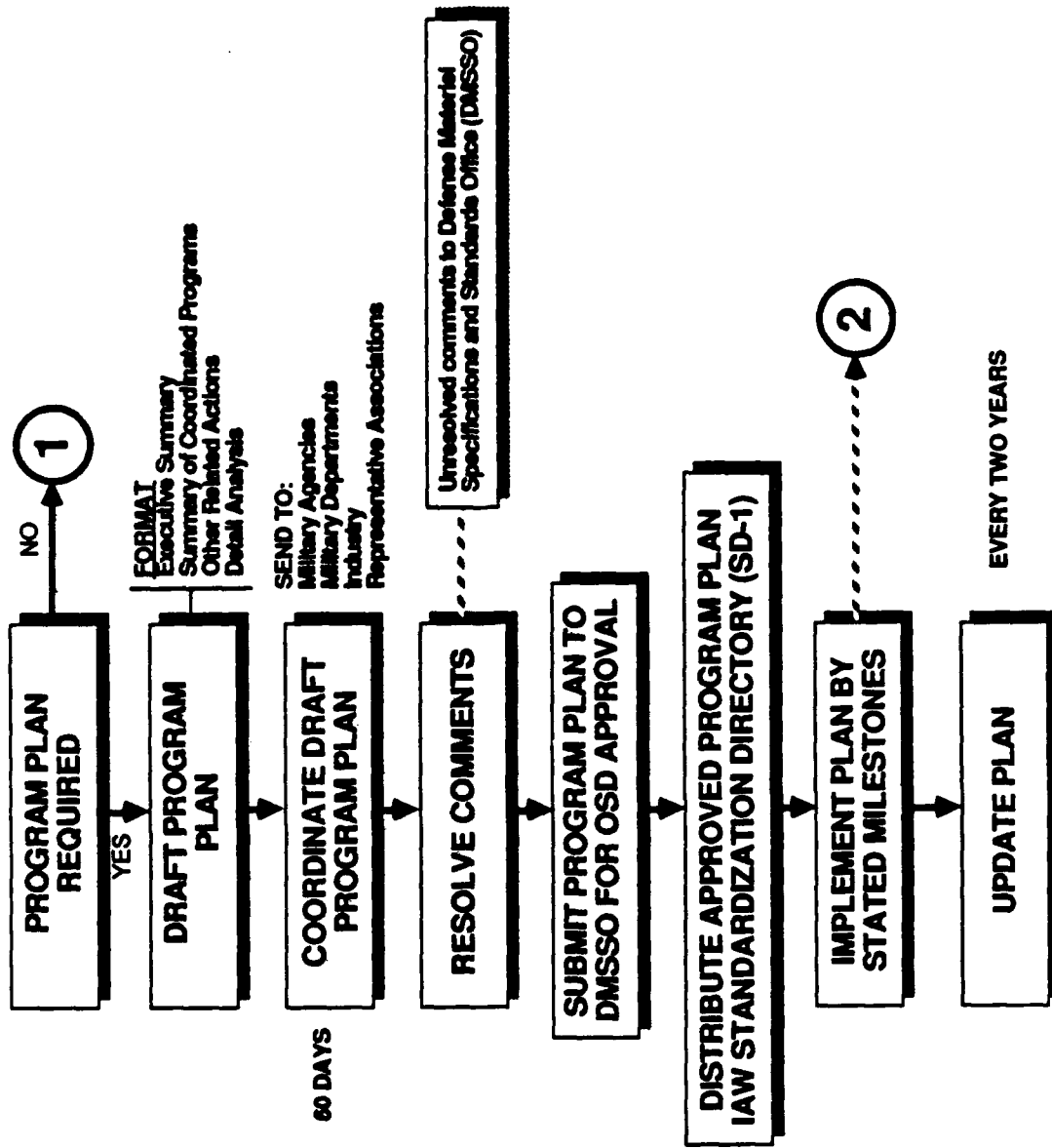
MANPOWER & PERSONNEL REQUIREMENT	ADD TO			APPLICABLE DIDS
	DOC.	PAGE	PARA.	
Soldier Performance Measurement (SPM) and Advanced Soldier Performance Measurement (ASPM) 9.	MIL-H-46855B	9	Integrate into a revised 3.2.3.2	DI-H-7058, Human Engineering Test Report
Manpower & Personnel Test & Evaluation (MPTE) and Advanced Manpower & Personnel Test & Evaluation (AMPTE) 10.	MIL-H-46855B	9	Integrate into a revised 3.2.3.2	DI-H-7053, Human Engineering Test Plan DI-H-7058, Human Engineering Test Report
Manpower & Personnel Configuration Test (MPCT) 11.	MIL-H-46855B	9	Integrate into a revised 3.2.3.2	DI-H-7053, Human Engineering Test Plan DI-H-7058, Human Engineering Test Report

APPENDIX E

**FLOW DIAGRAMS FOR
DOD STANDARDIZATION
DOCUMENT PROCESSING**

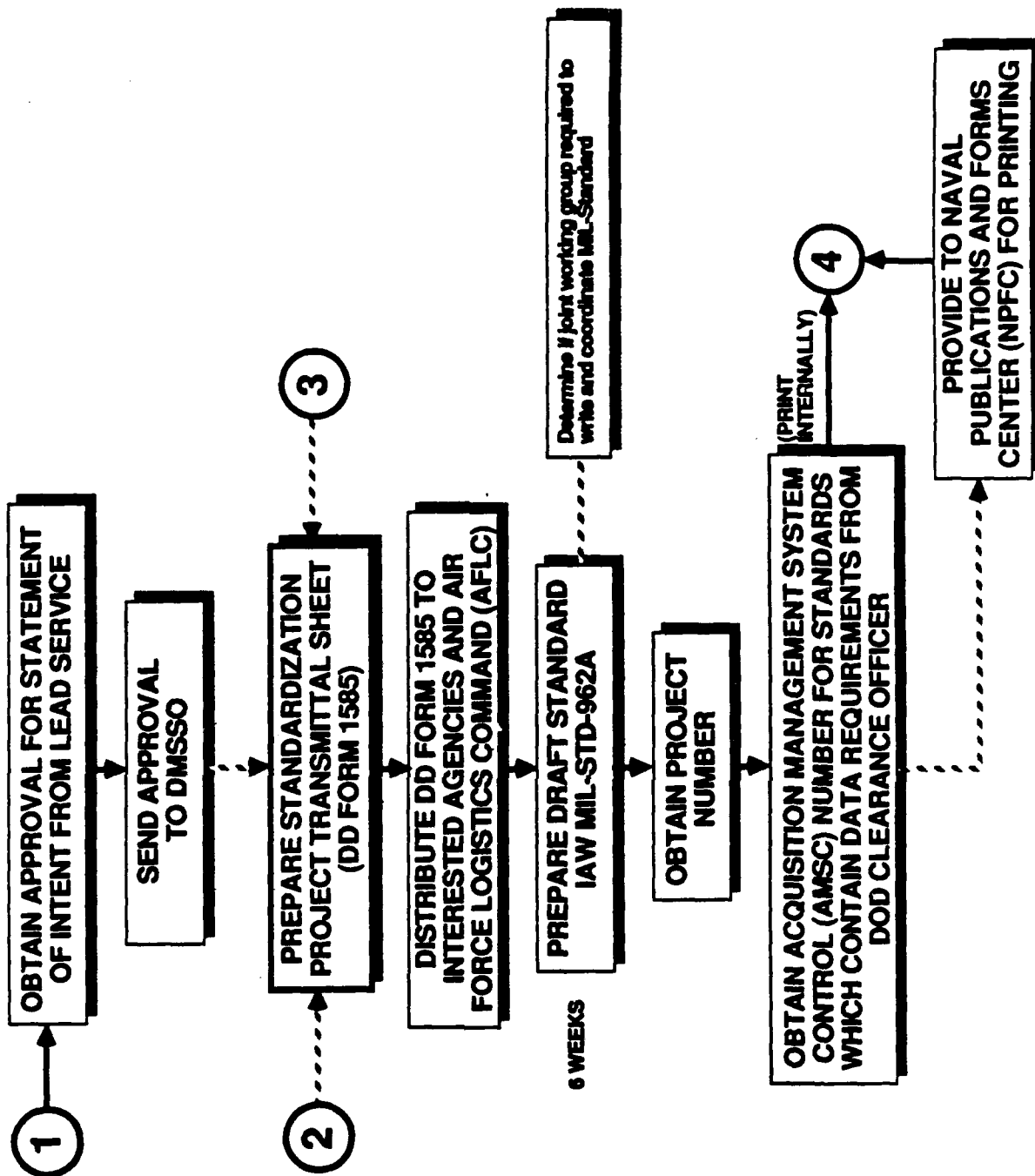
CREATE A COORDINATED MILITARY STANDARD

PROGRAM PLAN PHASE



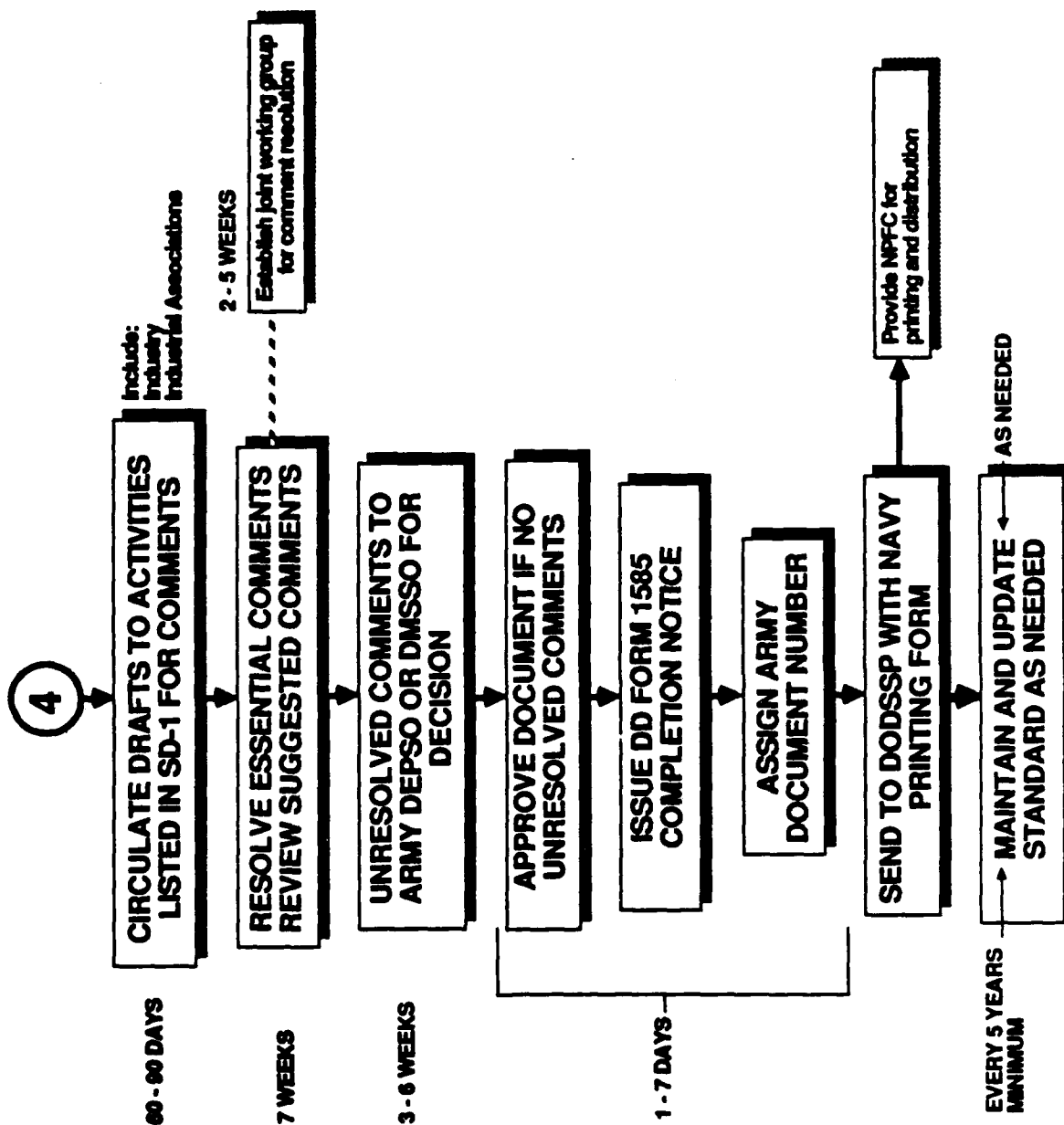
CREATE A COORDINATED MILITARY STANDARD

UNSCHEDULED PROJECT PHASE



CREATE A COORDINATED MILITARY STANDARD

REVIEW & APPROVAL PHASE



REVISE MILITARY STANDARD OR SPECIFICATION

